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ABSTRACT—***The unconscious mind is still viewed by many psychological scientists as the shadow of a "real" conscious mind, though there now exists substantial evidence that the unconscious is not identifiably less flexible, complex, controlling, deliberative, or action-oriented than is its counterpart. This "conscious-centric" bias is due in part to the operational definition within cognitive psychology that equates*** **unconscious** ***with*** **subliminal.** ***We review the evidence challenging this restricted view of the unconscious emerging from contemporary social cognition research, which has traditionally defined the unconscious in terms of its unintentional nature; this research has demonstrated the existence of several independent unconscious behavioral guidance systems: perceptual, evaluative, and motivational. From this perspective, it is concluded that in both phylogeny and ontogeny, actions of an unconscious mind precede the arrival of a conscious mind—that action precedes reflection.***

Contemporary perspectives on the unconscious mind are remarkably varied. In cognitive psychology, unconscious information processing has been equated with subliminal information processing, which raises the question, "How good is the mind at extracting meaning from stimuli of which one is not consciously aware?" (e.g., Greenwald, Klinger, & Schuh, 1995). Because subliminal-strength stimuli are relatively weak and of low intensity by definition, the mental processes they drive are necessarily minimal and unsophisticated, and so these studies have led to the conclusion that the powers of the unconscious mind are limited and that the unconscious is rather "dumb" (Loftus & Klinger, 1992).

Social psychology has approached the unconscious from a different angle. There, the traditional focus has been on mental processes of which the individual is unaware, not on stimuli of which one is unaware (e.g., Nisbett & Wilson, 1977). Over the past 30 years, there has been much research on the extent to which people are aware of the important influences on their judgments and decisions and of the reasons for their behavior. This research, in contrast with the cognitive psychology tradition, has led to the view that the unconscious mind is a pervasive, powerful influence over such higher mental processes (see review in Bargh, 2006).

And, of course, the Freudian model of the unconscious is still with us and continues to exert an influence over how many people think of "the unconscious," especially outside of psychological science. Freud's model of the unconscious as the primary guiding influence over daily life, even today, is more specific and detailed than any to be found in contemporary cognitive or social psychology. However, the data from which Freud developed the model were individual case studies involving abnormal thought and behavior (Freud, 1925/1961, p. 31), not the rigorous scientific experimentation on generally applicable principles of human behavior that inform the psychological models. Over the years, empirical tests have not been kind to the specifics of the Freudian model, though in broad-brush terms the cognitive and social psychological evidence does support Freud as to the existence of unconscious mentation and its potential to impact judgments and behavior (see Westen, 1999). Regardless of the fate of his specific model, Freud's historic importance in championing the powers of the unconscious mind is beyond any doubt.

How one views the power and influence of the unconscious relative to conscious modes of information processing largely depends on how one defines the unconscious. Until quite recently in the history of science and philosophy, mental life was considered entirely or mainly conscious in nature (e.g., Descartes' *cogito* and John Locke's "mind first" cosmology). The primacy of conscious thought for how people historically have thought about the mind is illustrated today in the words we use to describe other kinds of processes—all are modifications or qualifications of the word *conscious* (i.e., unconscious, preconscious, subconscious, nonconscious). Moreover, there has been high consensus regarding the qualities of conscious thought processes: they are intentional, controllable, serial in nature (consumptive of limited processing resources), and accessible to awareness (i.e., verbally reportable).

No such consensus exists yet for the unconscious, however. Because of the monolithic nature of the definition of a conscious process—if a process does not possess all of the qualities of a conscious process, it is therefore not conscious—at least two different "not conscious" processes were studied over the course

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of the 20th century within largely independent research traditions that seemed barely to notice the other's existence: the New Look research in perception involving the preconscious analysis of stimuli prior to the products of the analysis being furnished to conscious awareness, and skill-acquisition research involving the gain in efficiency of processes with practice over time until they become subconscious (see the review in Bargh & Chartrand, 2000).

Note how the qualities of the two not-conscious processes differ: in the New Look research, the person did not intend to engage in the process and was unaware of it; in the skill-acquisition research, the person did intend to engage in the process, which, once started, was capable of running off without need of conscious guidance. Typing and driving a car (for the experienced typist and driver, respectively) are classic examples of the latter—both are efficient procedures that can run off outside of consciousness, but nonetheless both are intentional processes. (One doesn't sit down to type without meaning to in the first place, and the same applies to driving a car.) These and other difficulties with the monolithic, all-or-nothing division of mental processes into either conscious or unconscious have resulted today in different "flavors" of the unconscious—different operational definitions that lead to dramatically different conclusions about the power and scope of the unconscious.

We therefore oppose the cognitive psychology equation of the unconscious with subliminal information processing for several reasons. First, this operational definition is both unnatural and unnecessarily restrictive. Subliminal stimuli do not occur naturally—they are by definition too weak or brief to enter conscious awareness. Thus, it is unfair to measure the capability of the unconscious in terms of how well it processes subliminal stimuli because unconscious (like conscious) processes evolved to deal and respond to naturally occurring (regular strength) stimuli; assessing the unconscious in terms of processing subliminal stimuli is analogous to evaluating the intelligence of a fish based on its behavior out of water. And as one might expect, the operational definition of the unconscious in terms of subliminal information processing has in fact led to the conclusion of the field that the unconscious is, well, rather dumb.

An article in a special issue of *American Psychologist* (Loftus & Klinger, 1992) once asked the question, "Is the unconscious smart or dumb?" Because *unconscious* was treated as *subliminal*—or how smart people are when reacting to stimuli of which they are unaware (e.g., Greenwald, 1992)—the consensus reached by the contributors and issue editors was that the unconscious is actually rather dumb as it is capable only of highly routinized activities and it perceives little without the aid of consciousness (Loftus & Klinger, 1992). (Note that while the unconscious may be "dumb" in regard to subliminal stimuli, it's still smarter than consciousness, which can't even tell that such stimuli have been presented!) The issue contributors concluded, for the most part, that although concept activation and primitive associative learning could occur unconsciously, anything complex requiring flexible responding, integration of stimuli, or higher mental processes could not.

However, the term *unconscious* originally had a different meaning. The earliest use of the term in the early 1800s referred to hypnotically induced behavior in which the hypnotized subject was not aware of the causes and reasons for his or her behavior (Goldsmith, 1934). In *On the Origin of Species,* Darwin (1859) used the term to refer to "unconscious selection" processes in nature and contrasted them with the intentional and deliberate selection long engaged in by farmers and animal breeders to develop better strains of corn, fatter cows, and woollier sheep. Freud, who credited the early hypnosis research with the original discovery of the unconscious (see Brill, 1938), also used the term to refer to behavior and ideation that was not consciously intended or caused—for example, "Freudian slips" and nearly all the examples given in *The Psychopathology of Everyday Life* involve unintended behavior, the source or cause of which was unknown to the individual. In all these cases, the term *unconscious* referred to the unintentional nature of the behavior or process, and the concomitant lack of awareness was not of the stimuli that provoked the behavior, but of the influence or consequences of those stimuli.

Thus, the use of the term *unconscious* was originally based on one's unintentional actions and not on one's ability to process subliminal-strength information (as the technology needed to present such information did not yet exist). And this equation of *unconscious* with *unintentional* is how unconscious phenomena have been conceptualized and studied within social psychology for the past quarter century or so. Nisbett and Wilson's (1977) seminal article posed the question, "To what extent are people aware of and able to report on the true causes of their behavior?" The answer was "not very well" (see also Wilson & Brekke, 1994), which was surprising and controversial at the time given the overall assumption of many that judgments and behavior (the higher mental processes) were typically consciously intended and thus available to conscious awareness. If these processes weren't accessible to awareness, then perhaps they weren't consciously intended, and if they weren't consciously intended, then how in fact were they accomplished?

This latter question motivated the social psychology research into priming and automaticity effects, which investigated the ways in which the higher mental processes such as judgment and social behavior could be triggered and then operate in the absence of conscious intent and guidance. Consequently, this research operationally defined unconscious influences in terms of a lack of awareness of the influences or effects of a triggering stimulus and not of the triggering stimulus itself (Bargh, 1992). And what a difference this change in operational definition makes! If one shifts the operational definition of the unconscious from the processing of stimuli of which one is not aware to the influences or effects of stimulus processing of which one is not aware, suddenly the true power and scope of the unconscious in daily life become apparent. Defining the unconscious in terms

of the former leads directly to the conclusion that it is dumb as dirt (Loftus & Klinger, 1992), whereas defining it in terms of the latter affords the opinion that it is highly intelligent and adaptive.

This expanded and enhanced view of the unconscious is also more compatible with theory and evidence in the field of evolutionary biology, than is the "subliminal only" view of cognitive psychology. As did Darwin and Freud, evolutionary biologists also think of the unconscious much more in terms of unintentional actions rather than unawareness of stimuli. In his seminal work, *The Selfish Gene,* Dawkins (1976) noted the awe-inspiring and intelligent designs in nature that arose merely through blind natural selection processes. He called nature the "blind watchmaker, the unconscious watchmaker," because there was no conscious intentional guiding hand in producing these intelligent designs (Dennett, 1991, 1995).

THE NATURAL UNCONSCIOUS OF EVOLUTIONARY BIOLOGY

Consonant with these basic assumptions in natural science, social cognition research over the past 25 years has produced a stream of surprising findings regarding complex judgmental and behavioral phenomena that operate outside of awareness. Because the findings did not make sense given the "dumb unconscious" perspective of the psychological science mainstream (to wit, how could a processing system so dumb accomplish so much in the way of adaptive self-regulation?), we had to look outside of psychology to understand them and their implications for the human mind. Happily, when placed in the broader context of the natural sciences, especially evolutionary biology, the widespread discoveries of sophisticated unconscious behavior guidance systems not only make sense, they turn out to have been predicted on a priori grounds (Dawkins, 1976; Dennett, 1991, 1995).

Genes, Culture, and Early Learning

Given the uncertainty of the future and the slow rate of genetic change, our genes have provided us not with fixed responses to specific events (because these cannot be anticipated with any degree of accuracy), but with general tendencies that are adaptive across local variations (Dawkins, 1976). It is for this reason that evolution has shaped us to be open-ended systems (Mayr, 1976). This open-ended quality gives room for "fine-tuning" the newborn to local conditions. Much of this is given to us by human culture, the local conditions (mainly social) of the world into which we happen to be born. Dawkins (1976) noted that phenotypic plasticity enables the infant to absorb, entirely automatically, "an already invented and largely debugged system of habits in the partly unstructured brain" (p. 193).

The gleaning of cultural knowledge is a giant step towards adaptation to the current local environment. Any human infant born today can be relocated immediately to any place and any culture in the world and will then adapt to and speak the language of that culture just as well as any child born there (Dennett, 1991). The cultural guides to appropriate behavior (including language, norms, and values) are "downloaded" during early childhood development, thereby greatly reducing the unpredictability of the child's world and his or her uncertainty as to how to act and behave in it.

And it is not just overall cultural norms and values that are so readily absorbed during this early period of life; we also absorb the particulars of the behavior and values of those closest to us, providing still finer tuning of appropriate-behavior tendencies. In a review of 25 years of infant imitation research, Meltzoff (2002) concluded that young children learn much about how to behave by mere passive imitation of fellow children and also their adult caretakers. Infants in particular are wide open to such imitative tendencies, having not yet developed cognitive control structures to suppress or inhibit them.

Unconscious Goal Pursuit as an Open-Ended System

Genes primarily drive our behavior through motivations (Tomasello et al., 2005). The active goal or motive is the local agent by which the genetic influence from the distant past finds expression. Evolution works through motives and strategies—the desired end states that we seek from whatever starting point in history and geographical location the cards of fate have dealt us (Tomasello et al., 2005).

Many recent studies have now shown that unconscious goal pursuit produces the same outcomes that conscious goal pursuit does (reviews in Dijksterhuis, Chartrand, & Aarts, 2007; Fitzsimons & Bargh, 2004). The goal concept, once activated without the participant's awareness, operates over extended time periods (without the person's conscious intent or monitoring) to guide thought or behavior towards the goal (e.g., Bargh, Gollwitzer, Lee-Chai, & Troetschel, 2001). For example, unobtrusive priming of the goal of cooperation causes participants playing the role of a fishing company to voluntarily put more fish back into a lake to replenish the fish population (thereby reducing their own profits) than did participants in a control condition (Bargh et al., 2001).

Moreover, the qualities of the underlying process appear to be the same, as participants with interrupted unconscious goals tend to want to resume and complete a boring task even when they have more attractive alternatives and will show more persistence on a task in the face of obstacles than do participants in control conditions (Bargh et al., 2001). These features have long characterized conscious goal pursuits (Lewin, 1935). What accounts for the similarity between unconscious and conscious goal pursuit? Given the late evolutionary arrival of conscious modes of thought and behavior (e.g., Donald, 1991), it is likely that conscious goal pursuit exapted, or made use of, already-existing unconscious motivational structures (Campbell, 1974; Dennett, 1995).

The open-ended nature of such unconscious goal pursuit is revealed by the fact that the goal operates on whatever goal-relevant information happens to occur next in the experimental situation (supraliminal, of course), which could not be known to the person beforehand—just as our genes programmed us to be capable of adapting to and thriving in local conditions far into a future that could not be anticipated in any detail. That the unconsciously operating goal is able to adapt to whatever happens next and use that information to advance the pursuit of the goal clearly demonstrates a level of flexibility that belies the "dumb unconscious" caricature, in which the unconscious is said to be capable only of rigid and fixed responses (Loftus & Klinger, 1992). The notion of the inflexible unconscious is also inconsistent with basic observations in the study of motor control, as highly-flexible online adjustments are made unconsciously during a motor act such as grasping a cup or blocking a soccer ball (Rosenbaum, 2002).

Social Behavior as Unconsciously Guided by the Current Context

The open-ended nature of our evolved design has also caused us to be highly sensitive and reactive to the present, local context. Just as evolution has given us general "good tricks" (Dennett, 1995) for survival and reproduction, and culture and early learning have fine-tuned our adaptive unconscious processes to the more specific local conditions into which we were born, *contextual priming* is a mechanism that provides still more precise adjustment to events and people in present time (Higgins & Bargh, 1987). In contextual priming, the mere presence of certain events and people automatically activates our representations of them, and concomitantly, all of the internal information (goals, knowledge, affect) stored in those representations that is relevant to responding back.

The evolved, innate basis of these ubiquitous priming effects is revealed by the fact that they are present soon after birth, underpinning the infant's imitative abilities (see Meltzoff, 2002). Such priming effects, in which what one perceives directly influences what one does, depend on the existence of a close, automatic connection between perception and behavior. Indeed, this tight connection has been discovered in cognitive neuroscience with the discovery of mirror neurons in the premotor cortex, which become active both when one perceives a given type of action by another person as well as when one engages in that action oneself (Frith & Wolpert, 2004).

The automatic perception–behavior link results in default tendencies to act in the same way as those around us (Dijksterhuis & Bargh, 2001). Thus, as a default option or starting point for your own behavior, blindly or unconsciously adopting what others around you are doing makes good adaptive sense, especially in new situations and with strangers. These default tendencies and their unconscious and unintentional nature have been demonstrated several times in human adults in the research of Chartrand and colleagues (see Chartrand, Maddux, & Lakin, 2005). Not only do people tend to adopt the physical behavior (posture, facial gestures, arm and hand movements) of strangers with whom they interact, without intending to or being aware they are doing so, but this unconscious imitation also tends to increase liking and bonding between the individuals, serving as a kind of natural "social glue."

Further supporting this notion of natural contextual tuning of one's behavior to the present environment, cognitive research indicates that action-related objects activate multiple action plans in parallel and that action production is driven by some form of selective disinhibition. For example, findings suggest that ambient stimuli (e.g., hammers) automatically set us to physically interact with the world (e.g., perform a power grip, Tucker & Ellis, 2001). The simultaneous activation of multiple action plans is obvious in action slips (Heckhausen & Beckmann, 1990) and in the neuropsychological syndrome of utilization behavior, in which patients are incapable of suppressing actions that are elicited by environmental, action-related objects (Lhermitte, 1983).

Preferences and Feelings as Unconscious Guides to the Present

Evolution (as well as early learning and culture) influences our preferences and, through them, our tendencies to approach or avoid aspects of our environment. We are predisposed to prefer certain objects and aspects of our environment over others. We are often guided by our feelings, intuitions, and gut reactions, which prioritize the things that are important to do or attend to (Damasio, 1996; Schwarz & Clore, 1996).

These guides do not arise out of thin air, however. Our present preferences are derived from those that served adaptive ends in the past. A tenet of evolutionary theory is that evolution builds gradually on what it has to work with at that moment; changes are slow and incremental (Allman, 2000). Knowledge gained at a lower level of blind selection—the short-cuts and other "good tricks" (Dennett, 1995) that consistently worked over our long-term evolutionary past—are fed upwards as a starting point and appear as a priori knowledge, the source of which we are unaware. Campbell (1974) called these "shortcut processes" because they save us (individually) from having to figure out from scratch which processes are helpful and which are dangerous.

Under the present argument that the unconscious evolved as a behavioral guidance system and as a source of adaptive and appropriate actional impulses, these unconsciously activated preferences should be found to be directly connected to behavioral mechanisms. Several studies have now established this connection: immediate and unintended evaluation processes are directly linked to approach and avoidance behavioral predispositions. Chen and Bargh (1999; see also Neumann, Förster, & Strack, 2003) showed that participants are faster to make approach movements of the arm (pulling a lever towards oneself)

when responding to positive attitude objects and are faster to make avoidance movements (pushing the lever away) when responding to negative attitude objects. This was true even though the conscious task in the experiment was not to evaluate the objects at all, but merely to "knock off the screen" the names of these objects as soon as they appeared.

This tight connection between immediate, unconscious evaluation and appropriate actional tendencies (approach vs. avoidance) is found throughout the animal kingdom; even single-celled paramecia have them. That the automatic activation of attitudes leads directly to corresponding muscular readiness in adult humans is thus surprising only from the perspective that actions and behavior are always a function of conscious intent and guidance (e.g., Bandura, 1986; Locke & Latham, 2002). Moreover, once one is engaged in these approach and avoidance behaviors, they "feed back" on our conscious judgments and feelings (so that subtly inducing a person to engage in approach-like or avoidance-like muscular actions produces positive or negative affect, respectively; Neumann et al., 2003), which is further support for the notion that action precedes reflection.

THE UNCONSCIOUS AS THE SOURCE OF BEHAVIORAL IMPULSES

The idea that action precedes reflection is not new. Several theorists have postulated that the conscious mind is not the source or origin of our behavior; instead, they theorize that impulses to act are unconsciously activated and that the role of consciousness is as gatekeeper and sense maker after the fact (Gazzaniga, 1985; James, 1890; Libet, 1986; Wegner, 2002). In this model, conscious processes kick in after a behavioral impulse has occurred in the brain—that is, the impulse is first generated unconsciously, and then consciousness claims (and experiences) it as its own. Yet, to date, there has been little said about where, exactly, those impulses come from.

Given the evidence reviewed above, however, there now seems to be an answer to this question. There are a multitude of behavioral impulses generated at any given time derived from our evolved motives and preferences, cultural norms and values, past experiences in similar situations, and from what other people are currently doing in that same situation. These impulses have afforded us unconsciously operating motives, preferences and associated approach and avoidance behavioral tendencies, as well as mimicry and other behavior priming effects triggered by the mere perception of others' behavior. There certainly seems to be no shortage of suggestions from our unconscious as to what to do in any given situation.

Conflict and Consciousness

Given the multiple sources of unconscious behavioral impulses occurring in parallel, conflicts between them are inevitable, as behavioral activity (unlike unconscious mental activity) takes place in a serial world in which we can do only one thing at a time. As noted above, early in ontogeny, actions tend to reflect the actions of an "unsuppressed" mind. There is no question that an infant would fail to endure pain or suppress elimination behaviors in return for some future reward. During development, however, operant learning assumes a greater influence on behavior, and actions begin to reflect suppression. This leads to the suppression of an action program, a neural event having interesting properties. It often involves conflicting intentions. In the delay of gratification, conflict may consist of the inclinations to both eat and not eat. Conflicting intentions have an aversive, subjective cost (Lewin, 1935; Morsella, 2005).

Regardless of the adaptiveness of one's plan (e.g., running across hot desert sand to reach water), strife that is coupled with conflict cannot be turned off voluntarily (Morsella, 2005). Inclinations can be behaviorally suppressed, but not mentally suppressed. Unconscious agents no longer influence behavior directly, but they now influence the nature of consciousness. Inclinations continue to be experienced consciously, even when they are not expressed behaviorally. Thus, they function like "internalized reflexes" (Vygotsky, 1962) that can be co-opted to play an essential role in mental simulation. As known by engineers the best way of knowing the consequences of a course of action (short of actually performing it) is to simulate it. One value of simulation is that knowledge of outcomes is learned without the risks of performing the actions. Indeed, some theorists now propose that the function of explicit, conscious memory is to simulate future, potential actions (Schacter & Addis, 2007).

Unconscious Guidance of Future Behavior

Such *simulacra* (i.e., the products of simulation) are worthless without some capability of evaluating them. If a general had no idea regarding what constitutes a favorable battle outcome, there would be no utility in simulating battle formations. Simulation can construct simulacra, but by itself cannot evaluate them. Evaluating potential actions is challenging because it depends on taking diverse considerations into account (e.g., physical or social consequences). Most knowledge regarding what is favorable is already embodied in the very agentic systems that, before the advent of suppression, controlled behavior directly. These now suppressed agents respond to simulacra as if they were responding to real, external stimuli. These internalized reflexes furnish the evaluative judgment or gut feelings that simulations require.

Unconscious conflict resolution processes thus furnish valuable information to conscious processes of planning for the future. Given sufficiently strong motivations and commitment to the planned course of action, specific plans such as "when *X* happens, I will do *Y*" themselves operate automatically when the future opportunity arises, as in the implementation intention research of Gollwitzer and colleagues (e.g., Gollwitzer, 1999). In this way, unconscious processes not only adapt us to the present situation, but they also influence the tracks we lay to guide our future behavior.

CONCLUSION

For most of human history, only the concepts of conscious thought and intentional behavior existed. In the 1800s, two very different developments—hypnotism and evolutionary theory—both pointed to the possibility of unconscious, unintended causes of human behavior. But nearly two centuries later, contemporary psychological science remains wedded to a conscious-centric model of the higher mental processes; it hasn't helped that our view of the powers of the unconscious mind have come largely from studies of subliminal information processing. This research, with its operational definition of the unconscious as a system that handles subliminal-strength stimulation from the environment, has helped to perpetuate the notion that conscious processes are primary and that they are the causal force behind most, if not all, human judgment and behavior (e.g., Locke & Latham, 2002).

We propose an alternative perspective, in which unconscious processes are defined in terms of their unintentional nature and the inherent lack of awareness is of the influence and effect of the triggering stimuli and not of the triggering stimuli (because nearly all naturally occurring stimuli are supraliminal). By this definition of the unconscious, which is the original and historic one, contemporary social cognition research on priming and automaticity effects have shown the existence of sophisticated, flexible, and adaptive unconscious behavior guidance systems. These would seem to be of high functional value, especially as default behavioral tendencies when the conscious mind, as is its wont, travels away from the present environment into the past or the future. It is nice to know that the unconscious is minding the store when the owner is absent.

In the rest of the natural sciences, especially neurobiology, the assumption of conscious primacy is not nearly as prevalent as in psychology. Complex and intelligent design in living things is not assumed to be driven by conscious processes on the part of the plant or animal, but instead by blindly adaptive processes that accrued through natural selection (Dennett, 1995). This is not to say that human consciousness plays no role or that it is not special in its powers to transform, manipulate, and convey information relative to the mental powers of other animals, but that this consciousness is not necessary to achieve the sophisticated, adaptive, and intelligent behavioral guidance demonstrated in the emerging priming literature. Unconscious processes are smart and adaptive throughout the living world, as Dawkins (1976) contended, and the psychological research evidence that has emerged since the time of his writing has confirmed that this principle extends to humans as well. In nature, the "unconscious mind" is the rule, not the exception.

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