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The Scientific Status of Unconscious Processes

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Probably no one's death has ever been heralded as many times, over as many years, as Sigmund Freud's. In one such obituary, published in the *New York Review of Books* (1993), Frederick Crews, a professor of English, penned a scathing critique of Freud and psychoanalysis, contending that psychoanalysis has "proved to be an indifferently successful and vastly inefficient method of removing neurotic symptoms," and that psychodynamic treatments produce "more converts than cures." He adds that "Freud's doctrine has been faring no better, in scientifically serious quarters, as a cluster of propositions about the mind," and that psychoanalytic theory is "without significant experimental or epidemiological support." [**Footnote 1:** Crews makes these assertions about the scientific status of psychoanalytic theory and therapy without apparent knowledge of the basic science literature to be reviewed here shortly or the psychotherapy outcome research that documents that even brief psychodynamically informed treatments are as effective as cognitive therapy and antidepressant medication in treating depression (Elkin et al, 1989) and of studies clearly demonstrating the efficacy of psychoanalytic forms of treatment (e.g., Ablon & Jones, in press; Fonagy & Moran, 1990; Jones & Pulos, 1993; Snyder et al, 1991).] Crews thus concludes that any body of knowledge built on Freud's dubious insights is likely to sink into quicksand, and that "despite some well-intentioned efforts at reform, a pseudoscience is what psychoanalysis has remained" (p. 55).

Certainly in the history of the psychoanalytic "movement," too many have treated psychoanalysis as dogma to be protected rather than a complex set of hypotheses to be tested. However, the recent obituaries declaring Freud's demise share two central problems. First, they report the death of the wrong psychoanalysis. Critics have typically focused on a version of psychoanalytic theory—circa 1920 at best—that few contemporary analysts find compelling. [**Footnote 2:** In so doing, however, they have set the terms of the public debate and have led many analysts, I believe mistakenly, down an indefensible path of trying to defend a 75 to 100-year-old version of a theory and therapy that has changed substantially since Freud laid its foundations at the turn of the century.]

Second, these critiques reflect a lack of knowledge of current psychological research relevant to their conclusions. A substantial body of evidence now suggests that Freud was right about a series of propositions that are central to *contemporary* psychoanalytic theory: (1) that enduring aspects of personality begin to coalesce in childhood, and that childhood experiences play an important role in personality development, particularly in shaping the ways people form later social relationships; (2) that mental representations of the self, others, and relationships guide people's interactions with others and play a substantial part in many forms of psychopathology; (3) that mental processes, including affective and motivational processes, operate simultaneously in parallel, so that individuals can have conflicting feelings toward the same person or situation and can craft compromises outside of awareness; (4) that personality development involves not only learning to regulate sexual and aggressive feelings and wishes but also moving from an immature dependent state to a mature interdependent one; and (5) that much of mental life is unconscious (Westen, 1998a; Westen & Gabbard, in press).

This article centers on the last and most central of these suppositions, about the existence of unconscious thoughts, feelings, and motives. [**Footnote 3:** Readers particularly interested in these issues will find a more comprehensive review in Westen, 1998b. See Fisher & Greenberg (1997) for a discussion of the empirical status of more classical Freudian theory, and Westen (1998a) for a discussion of the empirical status of *contemporary* psychoanalytic theory.] Ironically, at a time when the prestige of psychoanalysis is at low ebb in both psychiatry and academic psychology, an explosion of experimental research from a number of quarters in psychology—much of it conducted by researchers with little interest in, or knowledge about, psychoanalysis—has now documented conclusively that Freud was right in this central tenet.

The article proceeds as follows. The first section reviews evidence on unconscious thought and memory, focusing on the psychological and neuroanatomical distinction between implicit and explicit thought and memory--between ideas and memories that can be consciously re-

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trieved and manipulated and those that are expressed in behavior without conscious awareness. The second section examines the data on unconscious affect, ranging from studies showing that amnesic patients can retain feelings toward objects they cannot remember having seen, to studies showing the discrepancy between people's conscious racial attitudes and the unconscious associations that guide their behavior when their conscious values are not activated. Research in this area suggests not only that affect can be triggered outside of awareness but that people can regulate it—that is, defend—without conscious awareness of any feelings. The third section considers the data on unconscious motivation, once again reviewing an impressive body of literature documenting that motives activated outside of awareness not only influence behavior but have different developmental antecedents than the motives people can consciously report. [**Footnote 4:** Elsewhere (Westen, 1998a, 1999) I review the empirical data on unconscious conflict and defense, which is equally striking, both in its corroboration of basic psychoanalytic concepts and its suggestions of ways we may begin more precisely to establish the *mechanisms* involved in compromise formations.]

As will become clear, two general conclusions emerge from this review. The first is that the most fundamental assumption of psychoanalytic theory and practice is no longer a matter of scientific debate. Critics cannot continue to make pronouncements about the lack of scientific merit to psychoanalytic ideas without themselves offering scientific counter-evidence; indeed, one of the ironies of most of the critiques that have caught the public eye is that they have not themselves cited a single scientific investigation. The clear experimental documentation of unconscious thought, feeling, and emotion not only supports many aspects of psychoanalytic theory and practice but poses challenges to competing therapeutic schools that assume that change can be accomplished relatively quickly and without careful attention to uncovering and altering unconscious associative networks, which tend to change gradually and guide most behavior. [**Footnote 5:** Indeed, a recent meta-analysis of the voluminous research literature on short-term, primarily cognitive-behavioral treatments finds that, with the partial exception of the treatment of panic, where the data have suggestive implications for the importance of exposure-based interventions in even dynamically oriented treatments, short-term treatments have been unable to establish any lasting benefits beyond one year follow-up (Westen & Morrison, 1999).]

A second conclusion is that the experimental literature may have more to offer psychoanalysis than the opportunity for a well-deserved "I told you so." The body of research to be reviewed here has a number of implications for the way we think and speak about unconscious processes in psychoanalysis, which I briefly describe at the end of each section. Among the most important is that the concept of "*the* unconscious" has outlived its usefulness, because there are many different kinds of unconscious processes that serve different functions (many of which have different neuroanatomical substrates). To the extent that psychoanalysis remains an essentially functionalist approach—defining structures in terms of functions and focusing on the functions of symptoms, thoughts, memories, defenses, etc.--the delineation of unconscious processes with different functions requires a change in both our language and conceptualization.

THE EVIDENCE FOR UNCONSCIOUS COGNITIVE PROCESSES

Fifteen years ago cognitive scientists paid little attention to consciousness. Their models essentially assumed that the most important cognitive processes were conscious; memory was seen as the process of bringing thoughts into consciousness (or what was called short-term memory) (Atkinson and Shiffrin, 1968), and thought was seen as a process of consciously manipulating ideas and images to solve problems and make decisions (Newell & Simon, 1972).

In what is now called the "modal model" (because it was the standard, or most frequent, model for three decades) (Healy & McNamara, 1996), memory was described as a multi-stage process involving a series of memory stores: initial sensory registration (memory that lasts a flash of an instant, long enough, for example, to hold in memory the last syllable of a speaker's ongoing flow of words); short-term memory (a roughly thirty-second, seven-item memory store under conscious control, used for such purposes as dialing a phone number); and long-term memory (memory that can last a lifetime). Although by definition information in long-term memory that is not currently conscious must be unconscious—and by implication, affective valuations of objects must be stored unconsciously, along with motives that are not currently conscious—these implications were never developed. Instead, the assumption was that thoughts (and presumably motives and emotions, although these were not examined by memory researchers) could only influence action to the extent that they were perceived, registered, consciously processed, sent on to long-term memory, and retrieved into short-term memory (alias consciousness).

Implicit and Explicit Memory

In a brief span of years, matters have changed, so that the consensus among cognitive scientists today is that human thought and memory involve at least two systems, one conscious (called *explicit*) and the other unconscious (called *implicit*). Explicit memory involves conscious retrieval of information such as childhood memories or the name of a friend, whereas implicit memory refers to memory that is observable in behavior but is not consciously brought to mind (Roediger, 1990; Schacter, 1992, 1995).

Procedural Memory

One kind of implicit memory is *procedural memory*, "how to" knowledge of procedures or skills useful in vari-

ous situations, such as the motor memory involved in throwing a ball or playing a complex piece on the piano that once required considerable conscious attention, or behaviorally-expressed knowledge of subtle social rules (such as how close to stand to another person in conversation). People typically cannot report how they carry out these procedures, and when they try, they often make up plausible but incorrect explanations of how they did what they did (see Nisbett & Wilson, 1977; Wilson, 1996). Conscious reflection can actually disrupt these processes; the surest way for a pianist to make a mistake on a complex piece is to think about what she is doing. Procedural memory, like much of implicit memory, is often much faster than conscious retrieval, which is why people can play several measures of music far faster than they can explicitly interpret them, or why analytic supervisors often have to reconstruct the reasons for a technical suggestion to a supervisee post facto.

Associative Memory

Another kind of implicit memory of particular relevance to psychoanalysis involves *associative memory*—the formation of associations that guide mental processes and behavior outside of consciousness. Associative memory has been studied in priming experiments, in which the researcher presents subjects with a word or picture (the prime, such as "dog"), which is designed to activate associated thoughts or ideas unconsciously (such as "terrier"). The assumption behind these experiments is that priming can reveal the latent structure of associative networks by examining the impact of the prime on memory or judgment regarding semantically related words.

For example, subjects may be exposed to the word "dog" and then asked to press a button as soon as they know whether a set of letters flashed on a screen is a word. Subjects who have been primed with "dog" will show shorter response latencies (that is, a faster response) when subsequently presented with the word "terrier" than subjects who have not been similarly primed. According to one model, priming with the word dog activates a network of associations, spreading activation to anything on that network (see Collins & Loftus, 1977). Because words like terrier and poodle are thus already at a heightened state of activation, they require less stimulation to be consciously recognized. In the language of contemporary cognitive science, priming has rendered them more *accessible.*

The prime is often presented in some surreptitious way. In some studies, the prime is presented subliminally (for example, flashed at 100 milliseconds and then followed immediately by a masking stimulus, such as a row of numbers, that blocks conscious recognition). In others, the prime is presented supraliminally but in a way the subject does not realize is related to the subsequent experimental procedure. For example, the experimenter may ask subjects to press a button as soon as they recognize whether a word (which is actually the prime) has a "t" in it--thus exposing the subject to the word without the subject realizing why.

For the present purposes, one of the most important findings of priming studies is that subjects show priming effects under these surreptitious conditions (e.g., Bower and Schacter, 1990; Schacter, 1992). Exposing subjects to an infrequently-used word like "assassin" among a long list of words renders them more likely a week later to respond with assassin when asked to fill in the missing letters of the word fragment, A--A--IN. This is true even though they may have no conscious recollection of whether assassin was on the list they learned a week earlier (Tulving, Schacter, & Stark, 1982). In other words, they remember implicitly—because the network of associations still has some residual activation—despite their lack of explicit, conscious memory.

One way to study *subliminal* priming is to use dichotic listening tasks, in which subjects listen to two different streams of information simultaneously, one in each of the two channels of a pair of earphones. Subjects are taught to attend to only one channel using a procedure called shadowing, in which they repeat the information presented in one channel and learn to avoid being distracted by information from the other. Through this shadowing procedure, subjects become so adept at attending to the target channel that their conscious recognition memory for information presented in the unattended channel is at chance levels (e. g., their ability to guess whether they have heard the word "dog" in the unattended channel is no better than chance). Researchers have produced reliable subliminal priming effects using dichotic listening tasks of this sort. For example, presenting the word pair *taxi:cab* in the unattended channel renders subjects more likely to use the less preferred spelling of the auditorially presented homophone *fare/fair*, even though they have no idea that they even heard *taxi:cab* (see Nisbett & Wilson, 1977; Schacter, 1992).

Cognitive neuroscientists have had considerable success tracking down the neural underpinnings of the distinction between implicit and explicit memory. Several years ago, Milner and her colleagues (Milner, Corkin, & Teuber, 1968) described the memory disruptions in a man who came to be known as H.M, who had undergone radical surgery to control intractable seizures. The surgery involved removal of the locus of the seizures in the temporal lobes. Unfortunately, within the temporal lobes below the cortex is the hippocampus and connected cortical tissue (the *medial temporal memory system*), which is now known to be essential for learning new information that is consciously retrievable. Thus, each time H.M. met Milner, he had to be reintroduced. In fact, H.M. developed one of the densest amnesias on record, with a near incapacity to remember anything new.

Milner and her colleagues came to realize, however, that H.M. was in fact capable of certain kinds of learning, such as procedural skills. For example, like most unim-

paired people, when given practice over several sessions at learning to write words upside-down and backwards, H. M. gradually became more adept at the task—*but he had no idea that he had ever seen the task before.* Perhaps more significantly for our later discussion of unconscious emotion, H.M. also showed signs of affective associative learning—that is, forming new associations been affects and representations—even though he had no conscious recollection that those links had been formed. In one instance, following a visit to his mother in the hospital, H. M. remembered nothing of the visit but "expressed a vague idea that something might have happened to his mother" (Milner et al., 1968, p. 216). Animal research and subsequent studies of amnesics indicate that the hippocampus is essential for explicit, but not implicit memory (Schacter, 1987, 1995; Squire, 1986; Squire & Zola-Morgan, 1991).

Implications for the Psychoanalytic Understanding of Unconscious Processes

Data such as these have a number of implications for the psychoanalytic understanding of unconscious processes, which can only be described briefly here. When Freud first introduced the concept of the system preconscious (1900), he attributed to it a number of qualities. The preconscious included mental contents that were descriptively but not dynamically unconscious, stored in memory but readily accessible to consciousness because they were not offensive to it. The preconscious was more rational, disciplined, reality-oriented, and energically "bound" than the unconscious, which Freud characterized as operating on the basis of wishful, associative, instinctual, primary process thought. Freud (1915, 1939) continued to attribute these characteristics to the preconscious throughout his writings. The major amendments he made to his original description of the system preconscious came in The Ego and the Id (1923), when he disentangled the function of censorship from the preconscious, to which he had originally attributed it (and emphasized the link between the preconscious and language).

Research on unconscious thought and memory is of particular relevance to the system preconscious, rather than the dynamic unconscious, but it suggests two substantial clarifications and amendments to Freud's model. First, the concept of the preconscious fails to distinguish three very different phenomena that should be denoted by different names: (1) procedural knowledge (such as how to put words together grammatically, how to regulate emotional expression in ways that are socially appropriate in one's culture, how to tie one's shoes, or how to respond when an authority figure makes a request); (2) descriptively unconscious thoughts that are currently at a high level of activation; (3) and descriptively unconscious thoughts that exist as potentialities in memory but are not currently active.

The first class of preconscious processes, procedural knowledge, can be known *about* and refined through conscious attention, as when children learn explicit rules of grammar to refine the implicit rules that guide their grammatical constructions, or patients learn about their patterns of defense. However, procedural knowledge can never literally "become conscious" or be "made conscious" because it is not encoded as semantic propositions, images, or other forms that can be represented in consciousness.

The second class of preconscious processes—*activated* beliefs, fantasies, networks of association, and representations that are descriptively unconscious—can substantially influence conscious thought and behavior despite their lack of consciousness. The third class of preconscious processes—thoughts, associated affects, and motivational proclivities not currently at a high level of activation, many of which have been acquired through experience—are comparatively inert until activated. The distinction between activated and relatively inaccessible representations is, of course, more a matter of degree than a categorical distinction, but as we will see, it is as important clinically as well as conceptually, because activated associations influence ongoing thought, behavior, and feeling outside awareness, whereas associations that are not currently at a high state of activation have a much less substantial impact. Attending to unconscious dynamics requires careful attention to the *conditions that activate particular associative networks*.

In psychoanalysis, we have emphasized the impact of unconsciously active *motives* on conscious thought and behavior but have been less likely to recognize the importance of activated unconscious networks of association. Consider a patient who reports a difficult relationship with his father, describes a series of authority conflicts at work, and begins to display subtle signs of disrespect toward the analyst. One can presume that networks of association related to authority figures (or perhaps male authority figures, depending on his particular dynamics) have been activated and, by spreading activation to particular neural networks, are increasing the likelihood of certain ways of interpreting and reacting to both bosses and features of the analytic situation.

What experimental data suggest is that we would do well to have a theory of what it is about the analytic situation that primes particular reactions—and what important reactions may *not* be primed that might be worth knowing about, such as habitual reactions to people who trigger sibling-like transferences that are not as accessible through transference analysis because the analytic situation pulls more heavily for transferences in asymmetrical attachment relationships (namely parental transferences) (Westen, 1997). This research also lends credence to the view that features of the particular analyst do, indeed, make a difference in the transference reactions that emerge (Gabbard, 1996; Gill, 1982), *as well as in the associations patients produce.* Characteristics of the analyst such as age, gender, activity level, tendency to respond more or less empathically, and other idiosyncrasies undoubtedly prime specific networks of association above

and beyond those that can be assumed to be engendered in an "average expectable" analytic encounter (see Westen & Gabbard, 1999a).

In addition, the data on unconscious cognitive processes suggest that Freud's initial postulation of two systems (preconscious and unconscious), characterized by two different kinds of thought (secondary and primary), is problematic. The problematic nature of this distinction is significant because it has persisted in various forms in subsequent psychoanalytic writing long after Freud's shift to the structural model. As priming studies demonstrate, *preconscious* processes often operate by principles of association—a characteristic of primary process thinking ascribed only to dynamically unconscious processes. Freud wanted to distinguish two systems, one unconscious and repressed and the other unconscious but not repressed, but he also wanted to distinguish rational from associationist thinking. He fused these two classification systems into one, but the two are not isomorphic. Information is encoded in memory along networks of association regardless of whether the information is conflictual, and these networks can influence thought and behavior to the extent that they become activated unconsciously.

Freud, and particularly the ego psychologists who followed him, did, of course, ascribe considerable rationality to the ego, and the concepts of compromise formation and unconscious fantasy suggest that unconscious cognition can be quite complex. The problem, however, is that the most fundamental characteristic of primary process thought—its associative nature—is in fact not specific to wishful, motivated, or otherwise developmentally primitive thinking. Thus, the distinction between primary and secondary process thinking needs to be recast. In fact, the most sophisticated contemporary models of cognition suggest that *all* thought, memory, and perception—including our most complex cognitive processes—may actually involve activation of networks of association, where the units or "nodes" on those networks may be as small as a single neuron or set of neurons (see Smith, 1998; Read, 1997; Rumelhart, McClelland, et al., 1986).

A more parsimonious model than Freud's two-systems model of memory (preconscious and unconscious) would suggest that memory is organized along networks of association, some parts of which can become conscious and some parts of which are likely to remain unconscious even when highly activated because their content is threatening and would elicit too much unpleasant affect. When the latter parts of the network threaten to attract the "spotlight" of consciousness, unconscious procedures (defenses) are activated that prevent them from doing so, leaving only signs of their activation in derivative form.

THE EVIDENCE FOR UNCONSCIOUS AFFECTIVE PROCESSES

Remarkably, given a century-long history of resistance to the concept of unconscious processes, the existence of unconscious cognitive processes is no longer controversial in psychology or cognitive science. The existence of unconscious affective and motivational processes is another matter. Curiously, Freud (1915) himself was unconvinced that affect could be unconscious, although his clinical data and therapeutic technique presupposed it, and analytic theorists began making the concept of unconscious affect theoretically explicit by the 1960s (see Spezzano, 1993).

Several lines of experimental evidence support the notion that affective and motivational processes can be unconscious, and that such processes play an important role in human mental life. We begin with the data on unconscious affect and related data on unconscious defenses that protect against the experience of painful feelings. To presage the conclusion: investigations of patients with brain damage, conditioning experiments using human and other animals, and a variety of other scientifically rigorous studies have unequivocally documented that affective processes can be unconscious and that people can protect themselves against unpleasant feelings through unconscious defenses.

Neurological Data

One source of data for unconscious affect comes from neurology and cognitive neuroscience. As noted earlier, H.M., who suffered from hippocampal damage, was unable to remember new information but was nevertheless able to *feel* in some vague way that something had happened to his mother. Johnson, Kim, and Risse (1985) reported similar findings with Korsakoff's patients, whose alcohol abuse has impaired their ability to form new memories that can be consciously retrieved. In one experiment, Korsakoff's patients read about two fictional characters, one described with positive attributes and the other with negative qualities. Approximately 20 days later, they had difficulty recalling any of the information about the characters, but they preferred the "good" one. These neurological cases suggest that the neural circuitry for affective associative learning—for learning to connect stimuli with feelings--is distinct from the neural circuitry for conscious, explicit learning, just as is it is for thoughts.

Damasio and his colleagues (Bechara et al, 1995) have shown that subjects with hippocampal lesions, whose explicit memory is impaired, have difficulty learning that two events are connected, but they nevertheless respond *emotionally* as if they know. They can learn to avoid a stimulus associated with an aversive feeling even though they have no capacity to recognize the connection between the two events consciously.

Other research finds that prosopagnosics, who lose the capacity to recognize faces, nevertheless produce differential electrophysiological responses to familiar versus unfamiliar faces (Bruyer, 1991). They may not consciously know that the person in front of them is their wife, but they respond emotionally as if she is. Similar findings emerge in the study of split-brain patients, whose two

hemisphere have been surgically disconnected (Gazzaniga, 1985; LeDoux, Wilson, & Gazzaniga, 1977). These neurological conditions may actually point the way toward a better understanding of the neural substrate to the psychoanalytic distinction between cognitive insight and "emotional insight," because the latter appears to involve a reactivation of the associational network and not simply a knowledge of it or an attempt to rationalize a reaction.

Of relevance to these neurological studies is a body of evidence, brought together by Zajonc (1980), documenting the proposition that affective evaluations can precede much cognitive processing. For example, using a dichotic listening procedure, Wilson (1975) presented sequences of tones to subjects in the unattended channel. As expected, they were unable to recognize tone sequences they had heard as many as five times, since they had been trained to attend only to the other channel. However, when they were later asked to rate how much they liked each of several tone sequences, they reported liking the tone sequences they had heard better than those they had not. Their preference for the unconsciously familiar tone sequences reflected the *mere exposure effect*, the tendency to prefer familiar stimuli (Zajonc, 1968). Thus, subjects were essentially developing affective preferences outside of awareness--toward stimuli they had never consciously registered (see also Bargh, 1997; Eagle, 1959; Murphy and Zajonc, 1993).

The neural basis of such phenomena probably lies in the recent discovery that affect is processed through at least two parallel pathways (LeDoux, 1989, 1995). One pathway creates an immediate response based on innate reactions (such as a large object moving rapidly toward the face), conditioned responses (such as the association of a tone with electric shock, or a feeling of comfort associated with mother), and processes such as familiarity. This pathway runs directly from the thalamus (which processes sensory information and selectively transmits it to other parts of the brain) to the amygdala (which is involved in attaching emotional significance to objects). Essentially, this first pathway rapidly transmits a crude response to sensory features of a stimulus directly to the amygdala for immediate reaction. The second pathway involves more sophisticated cortical analysis of the meaning of the stimulus. The thalamus routes sensory information to the cortex, which activates associations to it and appraises its meaning. From there, this information is transmitted to the amygdala, which is involved in assessing its emotional significance.

Conditioning Phenomena and Unconscious Affective Processing

Another source of data on unconscious affect comes from research on conditioning processes. This may seem a rather unlikely source of support for psychoanalytic hypotheses, but much of behavioral research related to emotion can be readily reinterpreted as describing the way experience leads to associations between affects with representations of stimuli. In many respects, this translation is fairly straightforward because psychoanalysis, cognitive science, and behaviorism all share a common ancestor in the associationism of Hume, Locke, and other British philosophers of the early modern era.

In an important early investigation, Lazarus and McCleary (1951) paired nonsense syllables (e.g., *til, gak, fon*) with a mild electric shock, to produce a conditioned anxiety response. In other words, after several such pairings, subjects became anxious (as demonstrated both via subjective reports and physiological reactions) when exposed to these syllables alone (but not to other nonsense syllables not previously associated with electric shock) because they had become associatively linked to electric shock. The investigators subsequently exposed subjects to these conditioned stimuli (the nonsense syllables) subliminally and found that they reliably elicited a galvanic skin response (another name for skin conductance, an index of arousal) even though subjects could not consciously recognize having seen them. Numerous studies, including several using more recent technologies, have produced similar results using a variety of measures of unconscious affective activity, including evoked-related brain potentials, a measure of electrical activity in the brain (see Ohman, 1994; Weinberger, in preparation; Wong, Shevrin, & Williams, 1994). Subjects can not only *produce* but *acquire* conditioned emotional responses to stimuli they have never consciously perceived, for example, learning to associate electric shock with stimuli presented subliminally (e.g., Bunce, Bernat, Wong, & Shevrin, 1995; Esteves, et al, 1994; Wong et al, 1994).

Extrapolating to more real-life situations, what these studies suggest is that people can learn to associate aspects of situations (or significant others) with pleasant or unpleasant feelings without awareness. As a result, they can respond unconsciously to those cues, leading them to approach or avoid situations or people who unconsciously match the prototype of those earlier experiences, even though they may have no conscious awareness of the link between those cues and their feelings or of the memories that left these affective precipitates.

Unconscious Prejudice

Recent research on attitudes and prejudice (see Greenwald & Banaji, 1995; Greenwald et al., 1998) provides further evidence of unconscious affective processes. Several studies have shown that people in the U.S. who consider themselves non-racist often have two conflicting sets of attitudes that influence their behavior—a conscious, relatively non-prejudiced (or anti-prejudiced) set, and an unconscious, negative one (Devine, 1989; Dovidio & Gaertner, 1993). Fazio and his colleagues (Fazio, Jackson, Dunton, & Williams, 1995) have demonstrated that

conscious and unconscious racial attitudes can be entirely uncorrelated—that is, completely independent of each other. To measure unconscious associations to blacks, the investigators presented a series of black and white faces followed by either a positive or negative adjective. The subject's task was simply to press a key indicating whether the adjective was positive or negative. The theory behind this measurement strategy was that negative associations to blacks should facilitate (prime) responses to negative adjectives because both are associatively linked to negative feelings. Thus, response latency (the amount of time taken to respond) to negative words following priming with a black face can be used as a measure of the affective quality of unconscious associations. In other words, if subjects have negative unconscious associations to blacks, they should more quickly recognize negative words following priming with black faces, which have activated negative networks of association.

In fact, this measure of implicit attitudes predicted an ingenious implicit behavioral index of racism: At the end of the study, subjects were debriefed by a black undergraduate, who subsequently rated them on how friendly and interested they seemed in what she had to say. Subjects whose responses to negative adjectives showed the most robust impact of priming—that is, those whose associations to blacks were most negative—were rated by the undergraduate as least friendly and interested. Their unconscious associations did not, however, predict their conscious attitudes when asked to respond to some questions about the Rodney King beating and the ensuing riots in Los Angeles. In contrast, a measure of conscious racism predicted subjects' responses to these attitude questions but not their behavior with the black confederate. Similar findings have emerged in research on implicit and explicit attitudes toward gender, which appear to be only minimally correlated (Banaji & Hardin, 1997).

These studies demonstrate that when people are attending to their conscious attitudes, these attitudes influence their behavior. When they are not, which is much of the time in everyday life, their unconscious affective associations guide their actions (such as checking their wallet after a black man passes by, behaving toward women in condescending ways, or, to use a common clinical example, responding to the analyst with subtle devaluation while consciously reporting no such feelings).

In a remarkable series of studies, Steele (1997) has demonstrated how negative unconscious racial associations can affect even the people who are the targets of them. In one experiment, Steele and Aronson (1995) presented black and white Stanford undergraduates with the most difficult verbal items from the Scholastic Assessment Test (SAT). Black and white students were matched on SAT scores, so they were of similar intellectual ability. In one condition, students were told that the test did not measure anything significant about them. In the other condition, they were told that it measured their intellect. Black and white students in the first condition performed equally well, as one would expect, since they had similar SAT scores entering college. In the second condition, however, the performance of black students dropped substantially.

According to Steele, the second condition activated stereotype threat: Black students, like white students, have both been exposed to negative stereotypes about the intellectual abilities of blacks. Thus, when black students take a test believed to be diagnostic of their ability, these associations become active, generating performance anxiety, which can lead to diminished performance. In a second experiment using a similar design, Steele demonstrate how powerful these associations can be. Students filled out a demographic questionnaire before taking the test. In both of the two experimental conditions they filled out a demographic questionnaire, but in only one of those conditions did the questionnaire ask them to report their race. That simple manipulation led to a dramatic decline in the performance of black students.

Although Steele argues that these results reflect *knowledge* of stereotypes but not *internalization* of them, his research, along with a consistent body of evidence over several decades showing that show that black and white students do not differ in self-reported self-esteem, once again documents the distinction between conscious and unconscious feelings. For example, in what is essentially a projective test (see Westen, Feit, & Zittel, 1999), Steele gave subjects a word-stem completion task, on which they were asked to complete word stems like *lo---* and *du--* with whatever words first came to mind. Black students were more likely to complete these stems with words reflecting low unconscious self-esteem (such as *loser* and *dumb*). They were also more likely to complete word-stems such as *la--* with words related to negative racial stereotypes (*lazy*).

Psychoanalytically-Inspired Studies Relevant to Unconscious Affect

Beginning in the 1940s and 1950s, psychoanalytically-inspired researchers began using subliminal presentation of stimuli to test hypotheses about unconscious processes, many of which document the existence of unconscious affective processes (see Broadbent, 1977; Dixon, 1971, 1981; Erdelyi, 1985). In a classic study, McGinnies (1949) demonstrated, first, that people tend to recognize neutral words more rapidly than taboo words presented briefly on a screen; and second, that skin conductance (GSR) is higher during presentation of the taboo words prior to conscious recognition of them. These results suggests a preconscious stage of processing in which information is evaluated for its affective content, a position arrived at more recently by Bargh (1997).

Another study showed that people not only censor threatening information outside of awareness but that they

are particularly vigilant to it even though they cannot consciously perceive it (Blum, 1954). The experimenter exposed subjects to threatening and non-threatening images (such as castration-related images) at speeds that rendered them either far below the threshold for consciousness or near the threshold. At the longer exposures, as in the McGinnies study, neutral stimuli were more easily perceived; thus, anxiety-provoking stimuli took longer to recognize consciously. At the brief exposures, subjects had no idea what they had seen, but when asked which stimuli "stood out" most, they indicated that the threatening images seemed more salient. Thus, in this study, subjects appeared unconsciously both to recognize the affective meaning of subliminally presented stimuli and to defend against those that were threatening.

Other investigators (cited in Shevrin & Dickman, 1980) have used electroencephalographic (EEG) data to study responses to subliminally presented stimuli, focusing on differences in amplitude of evoked-related potentials in response to emotional versus neutral words presented subliminally. Heinemann and Emrich (1971) found that emotional words presented with gradually increasing intensity (beginning with an imperceptible intensity) evoked more alpha waves as assessed by EEG than neutral words, and did so *prior to conscious recognition*, again suggesting that their emotional content was processed prior to their conscious recognition. More recently, Shevrin and his colleagues (1995; Shevrin et al, 1996) have been using brain wave activity to examine the impact of subliminal and supraliminal presentation of words selected by a team of clinicians (based on extensive interview data) as relevant to the conflicts underlying patients' symptoms. The results suggest a different pattern of response to subliminal and supraliminal presentation of words consciously related to the symptom and those hypothesized to be unconsciously related to it.

Silverman and his colleagues (Weinberger & Hardaway, 1990; Silverman & Weinberger, 1988; Weinberger, in preparation) have demonstrated that subliminal presentation of stimuli hypothesized to be psychodynamically meaningful can affect a wide range of behavior. Particularly important are the results of a meta-analysis, a statistical procedure that calculates the average impact, or effect size, of experimental manipulations across a number of experiments, and thus provides a quantitative estimate of the robustness of the phenomenon. Using this technique, Weinberger & Hardaway (1990) found, in analyzing the results of over 100 studies, that subliminal stimulation of this sort does indeed influence subjects' responses. For example, male subjects presented subliminally with the stimulus, "Beating dad is OK" tend to show better performance on a competitive dart-throwing task than subjects presented with control stimuli such as "Being a doctor is OK" (see Palumbo & Gillman, 1984; Silverman, 1983).

Unconscious Affect and Defensive Processes

A discussion of unconscious affect invariably leads to literatures pertaining to psychological defense, since the function of defensive processes is to protect people from experiencing unpleasant emotional states such as anxiety and guilt or to ward off thoughts or memories that could activate those states. The most important research in this area is the work of Vaillant (Roston, Lee, & Vaillant, 1992; Vaillant, 1977), who has shown that reliably scored defenses, arranged according to three levels of adaptiveness (reality-distorting defenses such as gross denial, neurotic defenses such as repression, and mature defenses such as sublimation and humor), have a number of predictable correlates longitudinally as well as at a single time (such as presence of a personality disorder; Vaillant and Drake, 1985). Perry and Cooper (1989) have produced similar findings using a complex rating procedure to assess defenses in process during interviews.

Other researchers have tried to operationalize defense mechanisms empirically as well (see Cramer, 1991; Erdelyi, 1990; Paulhus, Fridhandler, & Hayes, 1997; Perry & Cooper, 1987; Smith & Westerlundh, 1980; Westen et al., 1997). For example, Davidson & MacGregor (1995) found that the self-reports of subjects low on general defensiveness tend to correlate relatively highly with descriptions of them by other people who know them well. The same is not true, however, for defensive subjects, who do not see themselves as they are seen by others. Hedegard (1969) experimentally manipulated anxiety level using hypnosis and then measured the impact on defenses assessed projectively. As predicted by theories that view defenses as hierarchically organized (A. Freud, 1936; Vaillant, 1977), she found that more intense anxiety evokes less mature defenses.

Unconscious Sexual Arousal

Several studies comparing self-reports and physiological indices of sexual arousal provide additional evidence of unconscious affect and defense. A recent study using genital plethysmography (which, in males, measures penile circumference, and hence degree of erection) provides evidence for the classic psychoanalytic theory of homophobia as a defense against threatening homosexual feelings (Adams, Wright, and Lohr, 1996). Male subjects were first identified as either homophobic or nonhomophobic by questionnaire. They were then shown videotapes of heterosexual, lesbian, and gay sex. Although both groups of men showed arousal at videotapes involving women performing sexual acts, the homophobic men, unlike their nonhomophobic counterparts, also showed increases in penile circumference (indicating arousal) while watching men have homosexual sex.

Other studies demonstrate dissociations between conscious and unconscious sexual arousal. For example,

Morokoff (1985) assessed sexual arousal in females using self-report and genital plethysmography while subjects viewed an erotic (heterosexual) videotape. Women high in self-reported sexual guilt self-reported less arousal. Their bodies, however, told a different story: These women showed *greater* physiological arousal than those low in sexual guilt.

Repression

The concept of repression has long been a lightning rod for disagreement between psychodynamic and other psychologists, and more generally between clinicians and experimental researchers (e.g., Holmes, 1990). Repression is now the centerpiece of renewed controversy because of claims of childhood sexual abuse and counterclaims of fabricated memories (see Loftus, 1993).

The clearest empirical evidence for repressed memories comes from a study that tracked down women who had been treated at a hospital for sexual molestation when they were children (Williams, 1994). Seventeen years after their documented abuse, 38% were amnesic for the incident, even though many reported other traumas, including later incidents of sexual abuse. The argument that these subjects may simply have forgotten the events is untenable, since having one's genitals violated with sufficient damage to require medical intervention is hardly a memory that simply dissipates with time. Indeed, qualitative data from the study document dynamic unconscious processes of defensive memory reconstruction. When asked if any family members had ever gotten into trouble for their sexual behavior, one subject who denied sexual abuse reported that before she was born an uncle had apparently molested a little girl and was stabbed to death by the girl's mother. Examination of newspaper reports 17 years earlier found that the subject herself had been one of the uncle's two victims, and that the mother of the other victim had indeed stabbed the perpetrator.

Narcissism and Self-Enhancement

Several other areas of research conducted by social psychologists, few of whom consider themselves psychodynamic, have nevertheless provided extensive experimental documentation of defensive processes (see Westen, 1994). For example, most people tend to view themselves as above average on most positive characteristics such as intelligence; in reality, of course, not everyone can be above average on most characteristics (see Epstein, 1992; Greenwald & Pratkanis, 1984).

Recent research on narcissism is of particular significance in this respect. John and Robins (1994) had eleven psychologists provide quantified personality descriptions of MBA students after observing them for a weekend. The students worked in teams of six to solve problems in a realistic simulation of a corporate decision-making meeting. The psychologists not only watched them during these meetings but also interacted with them over the course of the weekend. Aside from describing their personalities, the observers ranked subjects' contributions to the team effort. Subjects also ranked themselves and their peers on their performance, from one to six. Most people inflated their rankings by about one point; that is, if others saw them as the third-most important contributor out of the six team members, they saw themselves as second-most important, suggesting a defensive bias. Perhaps more important, people independently observed to be narcissistic tended to give themselves ranks two or more higher than their peers and the independent observers ranked them. In fact, the tendency of subjects to view themselves more positively than others viewed them correlated around r=.50 with psychologists' ratings of their narcissism.

In a longitudinal study, Robins and Beer (1996) showed some of the costs of defensive grandiosity, by comparing two groups of college freshman matched in level of ability (based on high school grades and GRE scores). One group was defensively self-enhancing, with self-reported academic competence and expectations of how they would perform in college much greater than their actual past performance (based on admission records). Subjects in the other group were relatively accurate in their assessments of their own abilities. At the end of their sophomore year, the self-enhancers were consciously just as pleased with their performance as the more realistic group, but the telltale sign of their defense was once again manifest not in their self-reports but in their behavior: The self-enhancers were 32 percent more likely to have dropped out of school. A series of studies by Colvin, Block, and Funder (1995) has further documented empirically some of the psychological costs of narcissistic defenses

Defense Against Unpleasant Emotions and its Physiological Correlates

Several other literatures bearing on psychological defense demonstrate the *psychophysiological* costs of a lack of attunement to one's own affective states. Dozier & Kobak (1992) studied defensive processes in adults with avoidant attachment styles, who are particularly defensive about their feelings in close relationships. In one study, they used physiological measures to document the discordance between what these individuals know and feel consciously and unconsciously. When asked about their relationships with their parents (and other attachment figures such as lovers), people with an avoidant attachment style dismiss the importance of attachment relationships or offer idealized generalizations about the relationships while being unable to back them up with specific examples (Main et al, 1985). Dozier and Kobak monitored skin conductance while subjects were asked to recall memories involving separation, rejection, and threat from their parents. As predicted, the more subjects used avoidant strategies (disavowing unpleasant feelings in their attachment relationships or providing sparse descriptions of emotionally significant interpersonal events), the more physiologi-

cal reactivity they manifested while answering affectively evocative questions about separations, rejections, and parental threats.

Two entirely different lines of research have produced parallel findings. Shedler, Mayman, & Manis (1994) hypothesized that people who remain unaware of their own considerable distress—described as having *illusory mental health*—should pay a price in terms of cardiac reactivity. In two studies, they studied people who reported themselves to be free of psychological distress and symptomatology but whose descriptions of their early memories showed signs of psychological disturbance. Subjects underwent a mildly stressful procedure that can be disturbing to someone who is highly defensive (reading aloud, performing a phrase association test, or providing projective stories). Subjects who described themselves as psychologically healthy but showed unconscious evidence of distress in their early memories manifested significantly more cardiac reactivity on a measure related to heart disease than subjects whose self-reports and early memories were concordant—that is, who were either high or low on anxiety as assessed both ways.

Thus, people who denied their unpleasant feelings, *unlike those who were distressed but knew it*, showed hyperarousal while performing a mildly threatening task. They also showed more indirect signs of anxiety (such as stammering, sighing, and avoiding the content of the stimulus) than the other groups, all the while declaring themselves to be the *least* anxious during these tasks. In more recent research, subjects with illusory mental health made significantly more trips to the doctor than subjects with either genuine mental health or acknowledged distress, suggesting that keeping oneself unaware of negative feelings translates into poorer physical health, increased hypochondriasis, or both (Cousineau & Shedler, 1995).

Research on a dimension labeled *repressive coping style* (which refers not to the use of repression but to a tendency to avoid feeling emotions as a way of managing distress, more akin to intellectualization, isolation of affect, and obsessive style in Shapiro's sense, 1965) also documents a direct link between defensive disavowal of affect, particularly anger, and physical illness (Schwartz, 1990; Weinberger, 1990, 1992). Individuals high on this dimension, like the avoidants in the Dozier and Kobak study and the subjects with illusory mental health in the studies by Shedler and colleagues, report low levels of anxiety while demonstrating marked physiological reactivity. Daniel Weinberger and his colleagues have demonstrated a link between this defensive style (particularly suppression of aggressive or angry feelings) and both cholesterol levels and asthma. Other research has uncovered an association between these defensive strategies and vulnerability to cancer (Jensen, 1987; Weinberger, 1992). Apparently, inhibiting conscious access to one's emotions places the body, and particularly the heart and the immune system, under considerable stress (see also Gross & Levenson, 1993). Freud may be dead, but his theories are proving increasingly useful in predicting who will be joining him sooner rather than later.

What is important about these studies is that they demonstrate the existence not only of unconscious affective processes but of *dynamically* unconscious processes. Of particular relevance to psychoanalytic *treatment* is research by Pennebaker (1989, 1997), which has demonstrated that writing about or discussing painful experiences (such as job loss in unemployed professionals) produces increases in immune functioning, physical health, and adaptive behavior (such as getting a new job). Pennebaker and his colleagues (Hughes, Uhlmann, & Pennebaker, 1994) have begun studying the moment-to-moment psychophysiological changes that occur as subjects write about painful or traumatic events that they have previously not discussed at length with anyone, by recording somatic changes that occur as subjects type each new word or phrase. Among other things, they have recently found that skin conductance increased when subjects used words expressing unpleasant emotion but also at the precise moments when their words were independently rated as evidencing denial or defensiveness.

In the short run, expressing unpleasant emotion leads to a momentary increase in arousal, but over the long run, doing so *decreases* arousal (Pennebaker, 1997). In contrast, keeping oneself unaware of what one really feels appears to maintain arousal continuously. Of relevance to these findings is a study in which group psychotherapy for women with advanced breast cancer extended their lives by an average of eighteen months relative to control subjects matched for stage of the illness (Spiegel, Bloom, Kramer, & Gottheil, 1989).

Implications for the Psychoanalytic Understanding of Unconscious Processes

The evidence on unconscious affective processes leads to a number of conclusions of relevance to the psychoanalytic understanding of unconscious processes, some with potential treatment implications. First, the data provide incontrovertible evidence that considerable affective processing occurs unconsciously in daily life, and that people can protect themselves against unconsciously threatening thoughts and feelings by altering them outside of awareness, just as psychoanalysis has argued for years based on clinical observation.

A second and related point is that affective processing occurs outside of awareness *regardless of whether the person is responding defensively*. People may not know what they feel because they do not want to know, but they may also not know what they feel, or what caused a feeling, because they are unaware of the unconscious associations that triggered their affects (see Westen, 1985, Chapter 2). Much of learning involves the unconscious association of representations with affects. As the neurological data described above attest, many forms of associative learning are mediated by different neural structures than

those involved in consciousness. In other words, we are unaware of many of our emotional reactions to people and other stimuli *simply because the associative processes that link affects and representations do not require consciousness*. This suggests two distinct reasons why free association would be useful as a therapeutic technique: (1) It bypasses defensive processes that inhibit conscious attention to certain thoughts, feelings, or motives; and (2) it is useful in mapping out the unconscious networks of association and the affects encoded along them that underlie much of psychopathology (see Westen & Gabbard, 1999b).

A third implication of these studies has a bearing on what it means to *remember* a traumatic event. A traumatic memory may be represented in multiple representational modes—including sensory and verbal—and may be available to various degrees for conscious representation. On the other hand, a memory of an event, particularly one that was overwhelming or that occurred pre-verbally, may be encoded as a procedural memory (a tendency to behave in a particular way under certain circumstances) or as a tendency to experience certain feelings, which may in turn evoke a set of affect-regulatory tendencies (such as defensive processes or impulsive actions). More commonly, a traumatic memory or series of traumatic events may be encoded in both ways, so that therapeutic work must be aimed not only at retrieving conscious representations of the event (what cognitive scientists call *episodic memory*, or memory of specific episodes) but also at altering the automatically elicited feelings, and ways of regulating those feelings, that are part of the implicit memory system. This harkens back to Freud's early formulation that hysterics suffer from reminiscences, or from bodily or other memories that occur in the absence of explicitly recalled or recallable events.

A fourth implication is even more treatment-specific. Affective associations can occur through classical conditioning processes (which, as noted above, in more psychoanalytic terms refer to the association of representations of stimuli with affect) without any cortical involvement and certainly without conscious involvement. This simply means that people often respond to other people and situations in patterned ways, unknowingly, based on their prior experiences with them or with others who share certain common features with them. Therapeutically, this provides experimental grounding for the use of psychoanalytic techniques such as free association, transference analysis (since affective reactions to the analyst are similarly triggered by cues of which the person may be unaware), and interpretation.

Phenomena of this sort also, however, point to potential limits to the insight-oriented treatment of cognitive-affective associations that have become automatized and require little or no cortical involvement, as in many intense phobic reactions. Reconstructing the way fear became associated with a particular representation (*explicit* knowledge) does not necessarily weaken the *implicit* neural connections between a representation of an object (particularly a primitive sensory representation at the thalamic level) and an affective response. Helping a patient change an emotional response of this sort (such as an automatic, instantaneous phobic reaction to public speaking, regardless of why that fear initially arose) may require a move back toward some of the earlier, more directive elements in the way Freud approached treatment. Freud insisted that insight alone will not eliminate a phobia if the person does not use this insight to force himself to confront it. Freud's own views suggest the potential importance of adjunctive or integrative use of more cognitive-behavioral techniques that emphasize *exposure* to the feared stimulus in the treatment of anxiety (see Wachtel, 1997; Westen, in press). For unconscious affective associations to change, the person has to come, through experience, to associate a representation with different emotions.

This issue may have more far-reaching implications for psychoanalytic technique than the treatment of phobias. Conditioned emotional responses (that is, feelings that arise spontaneously when a person thinks about or is confronted with someone or something associated with an emotion) can not only be triggered unconsciously but can be defended against unconsciously as well, so that neither the trigger nor the affect is manifestly apparent. Processes of this sort are not limited to phobias or other anxiety disorders. Consider the case of Mr. R, a patient who had received minimal encouragement as a child for his notable artistic talents, and who had in fact been repeatedly deeply humiliated by his parents (particularly his father) for efforts at mastery of his craft (which his father considered an unmanly pursuit). Mr. R repeatedly prevented himself from attaining career goals that were within his grasp by not following through with the process of making the requisite phone calls, sending the letters of inquiry, and presenting his work. When galleries did not spontaneously offer to show his pieces, he took this as evidence that he was, in fact, as incompetent as he feared. Thus, his actions led to consequences that confirmed his view that his father was right, and to the strengthening of a childhood association between wishing and disappointment. For Mr. R, as for many patients with depressive dynamics who are uncomfortable with compliments and often achieve far below the level at which they are capable, positive self-representations were dreaded, because they felt fraudulent, felt like a betrayal of his parents, threatened an identificatory link between himself and his parents (who at least shared a negative view of him), and activated wishes that had become associated with further disappointment.

An important part of Mr. R's treatment was having him sit with and elaborate instances in which he received praise, since praise was so uncomfortable for him. Experiencing praise and pride in himself without any adverse consequences was a direct psychoanalytic analog to behavioral treatments that expose phobic patients to phobic stimuli as a way of producing habituation or extinction of the emotional response (see Wachtel, 1997). In many re-

spects, of course, this can be understood as a corrective emotional experience or as a disconfirmation of a pathogenic unconscious belief (Weiss, 1993), although at times the link between the feeling and the defense against it is so strong and automatic that the affect-defense constellation takes on a functional autonomy independent of the beliefs or unconscious fantasies underlying it.

An important technical question is whether altering affective associations of this sort requires occasional introduction of deliberate, more structured interventions in treatment than is normative in psychoanalysis. In fact, in this particular treatment I suggested to the patient, when his defenses against pride and the negative affect he associated with it became clear, that we spend some time examining some of the successes and achievements he had never mentioned in treatment. Perhaps years later he may have done so spontaneously, and we would have taken that as an index of structural change. However, when a patient is treating a thought, memory, or affect (in this case, pride) like a phobic stimulus and avoiding it as a way of escaping the anxiety it engenders, waiting for him spontaneously to overcome the anxiety and face the fear may be a Catch-22, or at the very least a very inefficient technical stance, since the best way to overcome a fear is to expose himself to the conditions that elicit it and to begin forming new associations to it. Doing so may also allow access to associations that would not be as readily accessible if not *primed* by behaviors and free-associative material the patient was previously avoiding.

Further, because this patient had a tendency to filter out compliments and avoid ways of obtaining them, another part of the treatment involved working with him to *produce* the actions he was avoiding that would *elicit* positive feelings from others and toward himself, and giving him carefully titrated doses of realistically positive feedback on his successes. The former allowed us to explore the feelings he associated with praise and to begin to develop new associations to it because he was now receiving praise and having to confront his ambivalence toward it. The latter allowed us to do so directly in the therapeutic relationship, exploring his fantasies that I was being fooled, that I would be disappointed, that I was being disingenuous, that I would "turn on him" like his parents, that I might be hurt or feel diminished by his successes, and the like.

Note that the theoretical rationale for this technical move was less a self-psychological stance toward mirroring than a view, based on decades of research, that exposure is a key ingredient in altering chronic, automatically activated affective responses, combined with a dynamic understanding of the defenses that such responses can engender. It is important to note, as well, how this stance fostered rather than retarded insight into some central dynamics, since we now had access to associations that were previously unavailable, since he had previously behaved in ways that prevented him from receiving acclaim and hence activating associations to it. Of crucial importance, however, was that these complimentary statements were not gratuitous or euphemistic. They were also typically prefaced with a defense interpretation (e.g., "I know you aren't fond of compliments, but…") that both allowed them to register and fostered exploration of how he experienced positive feedback (in prior psychoanalytic eras, with a different metapsychology, seen as gratuitous "gratification") in a relationship with a transference object who mattered to him.

UNCONSCIOUS MOTIVATION

The data reviewed above on defensive processes simultaneously provide evidence for dynamic unconscious motivational processes, since a defense is by definition a motivated unconscious effort to minimize painful, or maximize pleasurable emotion. A growing body of evidence from other quarters, however, provides even more direct evidence for the existence of unconscious motivation.

Experimental Demonstrations of Unconscious Motivation

Some of the best data come from research comparing the two major ways psychologists have assessed motives: through self-reports and through projective tests, notably the Thematic Apperception Test (TAT). The correlation between these two types of measures typically hovers around zero (e.g., self-reported and projective assessments of the need for power tend to show no relation to each other; McClelland, Koestner, & Weinberger, 1989). In other words, conscious and unconscious motives appear to reflect the operations of autonomous systems.

Despite their lack of correlation with one another, each of these two types of measure nevertheless predicts relevant behavior. For example, over the long run, assessment of motives from TAT stories is much more predictive of entrepreneurial or managerial success than self-report measures of need for achievement or power. On the other hand, if subjects are told that they are about to take a test of intelligence or achievement, their self-reported achievement motivation will be a better predictor of their effort and performance than motives assessed from TAT responses.

How do we make sense of these findings? The investigators propose a simple but subtle answer: When conscious motives are activated, they guide behavior and can override unconscious motives. When they are not, which is much of the time, unconscious motives guide behavior.

Bargh (1997; Bargh & Barndollar, 1996) has documented the existence of unconscious motivational processes experimentally. He argues that motives, like thought processes, get automatized—that is, activated and carried out with little or no conscious awareness—through repeated use in a given situation. For some patients, behaving in a passive-aggressive way may become automatized as a routine way of responding to the requests of authority

figures because it allows simultaneous gratification of aggressive wishes while minimizing the chances of retaliation. Although this example links automatized motives to a pathological compromise formation, Bargh takes issue with the view of unconscious processes as largely irrational, arguing that the habitual, automatic unconscious motives people develop through repeated experiences in a given situation are often better guides to action than the conscious, presumably "rational" analysis they might construct of a current instance, which may not be adequately informed by their history of prior learning.

Although we are not accustomed to thinking this way about unconscious motives in psychoanalysis, this intriguing argument fits with experimental work by Wilson (e.g., Wilson & Schooler, 1991; Wilson et al, 1993) that finds that people's "gut level" feelings are often more effective guides to action, and lead to more subsequent satisfaction, than their reasoned reflections. For example, in one study, undergraduate subjects rated the extent to which they liked five art posters. In one condition, they were asked to give reasons before stating their preferences—to think about their preferences carefully--whereas in a control condition, subjects simply chose the poster they liked the most. The investigators hypothesized that people do not have conscious access to the reasons behind affective judgments of this sort, and that the post-hoc explanations they offered might actually momentarily alter their perceived preferences, leading them to believe they prefer posters that they would not have selected based on their feelings alone. At the end of the rating procedure, subjects were allowed to choose one poster to take home. A few weeks later the experimenters recontacted them and asked how satisfied they were with their choice. Subjects who had offered reasons for their preferences were significantly less satisfied with their choice than were subjects who had chosen without reflection.

Bargh has found that the same kind of priming procedures used in studies of cognition can actually be used to activate motives. For example, he and his colleagues surreptitiously primed subjects with words related to either achievement (e.g., "strive") or affiliation (e.g., "friend") using a scrambled sentence task, in which subjects unscrambled sentences that included achievement- or affiliation-related words. The investigators then asked subjects to participate in a seemingly unrelated "second experiment" that placed them in a situation of motivational conflict, in which they had to work with an incompetent partner on a puzzle task and receive a joint score. Subjects could either succeed, and hence make their partner feel humiliated and stupid, or not be so successful but protect the confederate's self-esteem.

As predicted, subjects who had been primed with achievement words outperformed subjects primed with affiliation words (and control subjects), even though, when asked later, they were unaware of the influence of the primes. In other words, simply exposing them to words like "success" increased the level of activation of unconscious achievement motives, momentarily increasing the strength of one side of the conflict. In some respects, this bears similarities to Freud's early discovery that hypnosis could temporarily strengthen the conscious will against an unconscious counter-will by increasing the strength of the dynamics on one side of a conflict (see Erdelyi, 1985). Not surprisingly, the experimental manipulation in this study, which was relatively minor (priming with a few words), wore off after a few trials. However, one variable that *then* predicted success was subjects' need for achievement *as assessed by the TAT*. In other words, after the effects of recent activation of a network of association related to achievement decayed, chronically active unconscious motives resumed control over behavior.

Other research relevant to the concept of transference has documented unconscious motivational processes as well. Lewicki (1985) demonstrated an unconscious transference process of sorts, in which subjects avoided a person whose physical appearance resembled an experimenter with whom they had a single, brief, unfriendly encounter. Subjects who did not have an unfriendly encounter with the experimenter did not show the same avoidance of the confederate. When the investigators asked subjects who avoided the person why they did so, almost all replied that their choice was random. In other words, the interaction produced an affective association of which they were unaware, which influenced their subsequent motivation.

Andersen and her colleagues have documented processes relevant to transference experimentally in ways that bear on the issue of unconscious motivation. In one study, they asked subjects to describe a significant other, and then embedded a piece of that description in the description of a fictional character (Andersen & Cole, 1991). Thus, if a subject described his mother as gentle, intelligent, feminine, and courageous, the investigators would create a fictional character who was described, among other things, as courageous. When subjects were later asked to remember as much as they could about the fictional character, they attributed other characteristics of their significant other (such as intelligent) to the character, even though these had not been part of the character's initial description. In subsequent research, Andersen and Baum (1994) similarly found a transference of affect from the significant other to the fictional character using a similar design.

In their latest work, Andersen and colleagues (1996) have linked this to motivation in a similar procedure in which subjects are led to believe that the fictional person is sitting in the room next door and are asked about their desires to meet or avoid the person. In as yet unpublished research, they have just demonstrated the same phenom-

ena when traits from the significant other are associated with the fictional person through *subliminal* presentation (Glassman and Andersen, 1997), documenting that unconscious feelings can be transferred from one person to another and motivate behavior toward the second person.

Research with neurologically impaired patients has also documented unconscious motivational processes. An early demonstration occurred almost a century ago, when Claparede (described in Cowey, 1991) shook hands with an amnesic patient suffering from Korsakoff's disorder. Claparede had concealed a pin between his fingers, which pricked the patient as their hands clasped. Upon meeting again, the patient was unable to recognize Claparede (because of her amnesia for recent events) but was nonetheless unwilling to shake his hand. Because of her deficits in explicit knowledge, she was unable to describe the reasons for her actions. Gazzaniga (1985; see Bargh, 1997) has similarly described the behavior of split-brain patients who can carry out instructions to produce some action presented to their right hemisphere (by sending the information exclusively to their left visual field). When subsequently asked what they are doing, they offer seemingly sensible but incorrect rationalizations for their behavior, since the motivation is inaccessible to their left hemisphere, which plays a greater role in consciousness and linguistic processing.

Implications for the Psychoanalytic Understanding of Unconscious Processes

Once again, these data not only support some of the most fundamental assumptions and assertions of psychoanalytic theory but also suggest refinements in our understanding of unconscious processes. First, we need a better theory of the conditions that activate unconscious motives and that lead them to influence conscious mental life and behavior. In *The Interpretation of Dreams*, Freud (Chapter 7) postulated that unconscious motives *are always active*. Although in some sense this may be true, particular motives are more active at some times than others, vary in their strength in different individuals and at different times, and are triggered by thoughts, feelings, and environmental events in ways that are crucial for understanding the way people act (Westen, 1997). The research by Bargh, for example, showed how even a seemingly trivial manipulation (surreptitious presentation of a word associated with achievement or affiliation) could lead to changes in behavior. Research on the constructs people use to process information about themselves and others (in psychoanalytic terms, representations of self, others, and relationships) consistently shows that when people process new information about someone (such as whether the person intended something hostile in an ambiguous statement), their inferences are influenced both by chronically used (characterological) and by *recently used* (primed) constructs (Higgins, 1990). The same appears to be true of motives, which must have the *potential* to be activated in order to influence behavior but also must be activated to do so.

Indeed, one of the aims of psychoanalytic treatment is to decrease the intensity and frequency with which maladaptive motives forged in childhood control behavior, because old motives are less likely to disappear entirely than to decrease in their power over behavior with treatment. What this means from the perspective of contemporary cognitive neuroscience is that the strength of the associations between the motive and the conditions that elicit it, which are essentially encoded in the synaptic connections between the neurons that link the two networks, are weakened. Precisely how this occurs, and whether alterations in psychoanalytic technique may facilitate it, are exciting areas of potential investigation, particularly given the relative dearth of theory and research on how *motives* change (e.g., how patients actually give up competitive or oedipal wishes, or how they actually internalize a soothing object in a way that decreases the intensity of dependent wishes).

Second, the research literature on unconscious motives, particularly the work of Bargh and Wilson, suggests the importance of disentangling *unconscious* motives from *primitive* motives. Motives of all sorts can become automatic and hence elicited unconsciously, regardless of whether they are developmentally primitive or repressed. Many of the motives that control our behavior and enter into compromise formations are not likely to be in awareness simply because consciousness does not have enough "processing space" to register all of the thoughts, motives, affects, and perceptions that are relevant at any given moment. As we work with our patients, for example, our behavior is likely influenced by a host of motives, such as the wish to be helpful, the wish to please internalized representations of supervisors, the wish to meet ideals of competence that began in the second year of life but have obviously developed since that time, the wish to know, the wish to be or feel omnipotent or omniscient, fears of making mistakes, and fears of acting out various countertransference dynamics. We simply could not be conscious of all of these motives, even the ones about which we have less conflict, while remaining able to listen with even a second ear.

Third and related, these findings challenge the concept of a primitive id as the primary repository of all motivation. Beginning in 1923, Freud described psychic structures in terms of function rather than level of consciousness. The function of the id is motivation; of the ego, adaptation; and of the superego, values and self-control. However, with the move from the topographic to the structural model, Freud's description of the id took on too many attributes of the system unconscious from the topographic model, notably its non-adaptive, primitive character. Unless we want to describe all human motivation as primitive, we need to distinguish motivational structures that range from those that are developmentally primitive to those that are quite refined, neither of which is tied to any particular level of consciousness, except to the extent that one might suppose that more primitive motives are more likely to require repression.

One way to dodge this theoretical bullet, of course, is to spread motives across all of Freud's psychic structures, as in ascribing realistic motives to the ego. To do so, however, is to undo the structural model, which identified sets of *functionally* related dynamics, which constituted Freud's structures. If the function of the ego can include motivation, and "the ego" is not a homunculus, then what is the function of the id? Even if some readers feel comfortable preserving the structural model with modifications of this sort, the point is that it is time to develop a theory of motivation that does not assume that all important motives are primitive or unconscious (see Westen, 1997). To the extent that we remain convinced that understanding development is crucial to understanding adult functioning and conflicts, then we will need to "weaken the association" among the terms *motive, unconscious, and primitive*.

CONCLUSION: THE FATE OF "THE UNCONSCIOUS"

This review has been necessarily incomplete, particularly with respect to its coverage of New Look research from the 1950s that demonstrated the influence of unconscious processes on perception (see Dixon, 1971, 1981; Erdelyi, 1985; Weinberger, in preparation). Nevertheless, I believe that, taken together, the studies described here lead to a single conclusion: Freud was right in his most central hypothesis, that much of mental life, including thought, feeling, and emotion, is unconscious. The findings of these studies are so robust, taken from so many unrelated areas of psychological research, that the hypothesis of the existence and importance of unconscious processes is probably as close as any hypothesis in the history of psychology to be able to claim the status of fact. [**Footnote 6:** In a curious turn of affairs, one could argue that the scientific investigation of unconscious processes has laid the foundation for psychoanalysis as a hermeneutic or interpretive art. What hermeneuticists who have tried to evade the jaws of science have never realized is the extent to which their epistemology is dependent upon a series of assertions about that mind that are *empirical propositions*, such as the assertion that the mind works in such a way as to produce surface manifestations of deeper, underlying structures or meanings which require interpretation. What the research reviewed here provides is an empirical rationale for that assumption: To the extent that networks of association operate unconsciously, and to the extent that pieces of those networks can be inaccessible to consciousness, the art of interpretation of the gaps in consciousness becomes essential not only to clinical work but to the science of the mind.] Indeed, that this hypothesis has led to such heated debate for a century is ironic, given that developmental research shows that *children* in our culture begin to recognize the nature and functions of unconscious processes, such as some defensive processes, by the time they are ten or twelve years old (Chandler, Koch, & Paget, 1978). How such processes could, therefore, have eluded many psychologists, psychiatrists, and humanities professors is an interesting question. I suspect the answer may require the kind of ad hominem explanations to which Freud has been so regularly subjected, but I will leave this to intellectual historians and readers' aggressive fantasies.

There is, however, another message worth taking away from the literature reviewed here, which I have attempted gradually to suggest by addressing at the end of each section some of the implications of the research reviewed for the psychoanalytic understanding of unconscious processes. Researchers have studied a multitude of unconscious processes, which serve many functions, ranging from sensation and perception to memory, decision-making, emotion, and motivation. When we normally describe properties of mental processes—their function, their adaptiveness, their speed, their effectiveness, the degree to which they distort reality, the degree to which they lead to distress, etc.—we speak adjectivally, not nominally. That is, we do not group a class of cognitive processes together and call them "the cognitive," any more than we speak of "the efficient," "the adaptive," or "the distressing." Nor should we lump a large set of processes together and call them "*the* unconscious," as if they all do the same thing, serve the same function, or operate under the same principles. *We should instead speak of unconscious processes*. Let me now say why I do not think this is just semantic quibbling. [**Footnote 7:** Analytic theorists have made similar arguments against reifying concepts from Freud's structural model since the 1960s.]

Writing about "the unconscious" made sense to Freud given the intellectual context of his era. Philosophers were speculating that deep inside the human soul is a driving force that is greater than us all, that impels us to act in ways that do its bidding, rather than ours. Freud converted this quasi-religious notion into a set of secular propositions about the mind, and in the process changed human self-understanding (see Ellenberger, 1970; Weinberger, in preparation). He recognized that his patients often seemed to act on impulses outside of their awareness, and he linked this with the notion of a mind ruled by animal instincts beyond the control of the hapless rider trying to rein them in and domesticate them.

The linking of the unconscious to the primitive and instinctual, however, was not altogether accurate, and Freud began to rectify this with his move from the topographic to the structural model, since he realized that many ego and superego processes are unconscious. Vestiges of this earlier way of thinking, however, remained in his thought (particularly his concept of the id) and can be seen today when clinicians and theorists speak of "the unconscious" as though it were a unified and isolated sector of the mind. Although as clinicians we focus on unconscious processes gone awry, from an evolutionary standpoint, the capacity to process information, form affect-laden associations, and behave on the basis of wishes and fears that are unconscious is of tremendous adaptive significance--and much older than the capacity for reflective consciousness. Phobias are maladaptive, but fears are not, and they can be

learned and can guide behavior in adaptive directions unconsciously. We may similarly have no awareness of the processes that lead us to prefer some foods to others, but many of these processes have been selected over millenia by natural selection because they impel us to consume foods that supply nutrients and avoid others that are potentially toxic.

When feelings from the past influence current action, they can certainly be maladaptive, especially when current situations do not resemble prior experiences, such as unpleasant childhood interactions with parents—or when current experiences *need not* resemble these prior experiences but do so because the patient continually recreates them. On the other hand, as we have seen, relatively unreflective emotional responses can also lead to *better* decisions than carefully reasoned choices (Wilson et al, 1991) because affects are guides for action, and they are typically generated unconsciously. Similarly, many skills are unconscious, but they are hardly irrational or childish. The art of clinical supervision, for example, lies in making the implicit explicit, taking the unconscious "grammars" we use to understand and treat patients and articulating them so that another generation of clinicians can benefit from them. If research in cognitive science and psycholinguistics provides any indication, most clinicians can probably articulate only a minute percentage of the rules they use to interpret meaning or to time their interventions so their patients can hear them. We are all much more expert unconsciously than consciously because expertise implies automatization of processes that may have once required conscious attention.

The vestiges of the 19th century "unconscious" can be seen, as well, in Freud's concept of primary process, which confounds a mode of cognition (associative thought) with a primitive form of motivation. Ideas, thoughts, and feelings are arranged along associative networks, and these associations unconsciously guide behavior. As noted above, that is one of the main reasons free association is so useful: It gives us access to these networks, which are unconscious *regardless* of whether they are conflict-laden or connected with developmentally primitive wishes. Networks of association are crucial to adaptive behavior because they provide information about the regularities of the social and nonsocial world and hence allow us to predict, categorize, and respond.

Associative thinking is not wishful thinking. In fact, it can just as easily be fear-laden, depending on what objects and affects the person has come to associate through experience. Neither dreams nor the poorly regulated associative processes of psychotic patients support Freud's assertion of a linkage between wishful and associative thinking, since they are as likely (if not more likely, in the case of psychotic thought) to be frightening as wish-fulfilling. The only reason Freud had to go to such extraordinary efforts in *The Interpretation of Dreams* to explain nightmares as wish-fulfilling was that he was constrained by his unconscious assumption that several antinomies could be reduced to a single distinction: conscious/unconscious, rational/irrational, mature/primitive, and civilized/instinctive. These are not, however, synonyms. And we would do well, at last, to retire the concept of *the* unconscious.

I hope readers are sufficiently convinced at this point that empirical research of the type reviewed here may be useful not only for testing basic psychoanalytic hypotheses and models but for refining them. But that is only a secondary message of this paper. The primary message should be clear: After a hundred years of controversy, we can now put to rest the criticism of psychoanalysis that its most fundamental assertion—the importance of unconscious processes—is mistaken or without empirical foundation. The data are incontrovertible: Consciousness is the tip of the psychic iceberg Freud imagined it to be.

Summary. At regular intervals for over half a century, critiques of Freud and psychoanalysis have emerged in the popular media and intellectual circles, usually declaring that Freud has died some new and agonizing death, and that the enterprise he created should be buried along with him like artifacts in the tomb of an Egyptian king. Although the critiques take many forms, one of the central claims has long been that unconscious processes, like other psychoanalytic constructs, lack any basis in scientific research. In recent years, however, a large body of experimental research has emerged in a number of independent literatures (such as research on unconscious thought, unconscious affective learning, unconscious prejudice, and the differential neural circuitry underlying conscious and unconscious processes) documenting the most fundamental tenet of psychoanalysis, that much of mental life is unconscious, and that this extends to cognitive, affective, and motivational processes. Examination of this body of research points both to revisions in the psychoanalytic understanding of unconscious processes and to the conclusion that, *based on controlled scientific investigations alone* (that is, without even considering clinical data), the repeated broadside attacks on psychoanalysis are no longer tenable.

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