

The Scientific Legacy of Sigmund Freud: Toward a Psychodynamically Informed Psychological Science

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Although commentators periodically declare that Freud is dead, his repeated burials lie on shaky grounds. Critics typically attack an archaic version of psychodynamic theory that most clinicians similarly consider obsolete. Central to contemporary psychodynamic theory is a series of propositions about (a) unconscious cognitive, affective, and motivational processes; (b) ambivalence and the tendency for affective and motivational dynamics to operate in parallel and produce compromise solutions; (c) the origins of many personality and social dispositions in childhood; (d) mental representations of the self, others, and relationships; and (e) developmental dynamics. An enormous body of research in cognitive, social, developmental, and personality psychology now supports many of these propositions. Freud's scientific legacy has implications for a wide range of domains in psychology, such as integration of affective and motivational constraints into connectionist models in cognitive science.

Freud, like Elvis, has been dead for a number of years but continues to be cited with some regularity. Although the majority of clinicians report that they rely to some degree upon psychodynamic¹ principles in their work (Pope, Tabachnick, & Keith-Spiegel, 1987), most researchers consider psychodynamic ideas to be at worst absurd and obsolete and at best irrelevant or of little scientific interest. In the lead article of a recent edition of *Psychological Science*, Crews (1996) arrived at a conclusion shared by many: "[T]here is literally nothing to be said, scientifically or therapeutically, to the advantage of the entire Freudian system or any of its component dogmas" (p. 63).

Despite the explosion of empirical studies of unconscious cognitive processes (see, e.g., Greenwald, 1992; Kihlstrom, 1987; Schacter, 1992), few reference Freud; none cite any contemporary psychodynamic work; and in general, psychodynamic concepts are decreasingly represented in the major psychology journals (Robins & Craik, 1994). The situation is similar in the popular media and in broader intellectual discourse. Publications ranging from *Time* to the *New York Review of Books* periodically publish Freud's intellectual obituary, with critics charging that Freud's ideas—such as his dual-instinct theory or his hypotheses about female personality development—are seriously out of date and without scientific merit (e.g., Crews, 1993).

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Many aspects of Freudian theory are indeed out of date, and they should be: Freud died in 1939, and he has been slow to undertake further revisions. His critics, however, are equally behind the times, attacking Freudian views of the 1920s as if they continue to have some currency in their original form. Psychodynamic theory and therapy have evolved considerably since 1939 when Freud's bearded countenance was last sighted in earnest. Contemporary psychoanalysts and psychodynamic therapists no longer write much about ids and egos, nor do they conceive of treatment for psychological disorders as an archaeological expedition in search of lost memories (Aron, 1996; Gabbard, 1994; Horowitz, 1988; Kolb, Cooper, & Fishman, 1995; Mitchell, 1988; Wachtel, 1993). People do sometimes describe feelings or behaviors in therapy that conform remarkably to aspects of Freud's psychosexual theories (such as a patient of mine with erectile problems whose associations to a sexual encounter led to an image of having sex with his mother, followed by some unpleasant anal imagery). Nevertheless, psychotherapists who rely on theories derived from Freud do not typically spend their time lying in wait for phallic symbols. They pay attention to sexuality, because it is an important part of human life and intimate relationships and one that is often filled with conflict. Today, however, most psychodynamic theorists and therapists spend much of their time helping people with problematic interpersonal patterns, such as difficulty getting emotionally intimate or repeatedly getting intimate with the wrong kind of person (see Greenberg & Mitchell, 1983).

In psychology, students' introduction to psychodynamic the-

¹ The term *psychodynamic* was once more easily distinguished from *psychoanalytic*, because it included under its umbrella a variety of approaches that took as axiomatic Freud's postulation of unconscious mental processes but eschewed his libido theory. Today, however, the distinction is less clear, because mainstream psychoanalytic thinking is much more interpersonal and no longer wedded to many classically Freudian notions.

ory resembles the view found in the popular media and in scientific journals. I recently asked a research assistant with access to the latest editions of the major textbooks to conduct a brief study of the index entries of 10 leading upper-level introductory textbooks. Two of the 10 cited object relations theory, the major development in psychodynamic theory over the past 30 years. Of the 4 most prominent contemporary psychoanalytic theorists—Otto Kernberg, Heinz Kohut, Stephen Mitchell, and Charles Brenner—Kohut was cited in 3 books, Kernberg and Brenner were cited once each, and Mitchell was not cited in any. This is analogous to presenting trait psychology without referencing Costa and McCrae. My intention is not to lay blame here, which lies equally with psychoanalysts who have made too much of their work obscure to psychologists, but simply to demonstrate the widespread nature of the problem.²

Psychodynamic thinking has, in fact, continued to flourish over the past decades and has been progressively converging with the concerns of personality, social, and developmental psychologists (see Barron, Eagle, & Wolitzky, 1992; Westen, 1990a). This largely reflects three shifts. The first is the cognitive revolution, which brought mental processes, including unconscious processes, back into psychological discourse. Although this revolution began with cognition, the lifting of the taboo on mental processes imposed by behaviorism has inevitably led to a renewed focus on affect and motivation, the primary areas of psychodynamic interest. Indeed, as cognitive neuroscience progressively moves into these areas, it will probably have to be renamed.

The second shift is that psychodynamic theory was not mummified and buried along with its founder 60 years ago. Psychoanalysis may have been “deconstructed,” but it has not been decomposing. For example, Freud’s dual-instinct theory (involving sex and aggression) is the primary, if not the only, psychodynamic model of motivation learned by most undergraduate psychology majors, because it is the primary one taught in textbooks. Yet most contemporary psychodynamic psychologists hold that humans have a number of motives, many of them rooted in biology but nearly all elaborated upon by culture and experience. Whereas Freud emphasized the pursuit of sensual and sexual pleasure, object relations theorists, self psychologists, and relational theorists have added a focus on needs for relationships and self-esteem (see Aron, 1996; Fairbairn, 1952; Greenberg & Mitchell, 1983; Kernberg, 1975; Kohut, 1977; Sullivan, 1953). To reject psychodynamic thinking because Freud’s instinct theory or his view of women is dated is like rejecting modern physics because Newton did not understand relativity.

The third shift is epistemological. For years, many in the psychoanalytic community have treated psychoanalysis as a religion and have been more interested in protecting than testing psychoanalytic dogma. This has clearly contributed to the widespread distaste for psychodynamic concepts in academic psychology. Far too many analysts continue to ignore or disparage efforts to test their theories as the folly of ignorant infidels and to dismiss alternative hypotheses, conceptualizations, and treatment techniques—and they do so at the peril of their patients. However, the infusion of psychologists into psychoanalysis over recent decades (and to some extent the increasing medicalization of psychiatry) has led to a greater appreciation for

empirical work, an acknowledgment that psychoanalytic propositions do not rise and fall solely on the basis of their perceived clinical utility, and a recognition that “I had a patient once” is not the firmest of epistemological foundations. Conversely, many cognitive researchers have begun paying greater attention to the ecological validity of experimental work on thought and memory, which is leading to, among other things, a heightened focus on affect and motivation, the central domains of psychoanalysis (e.g., Ceci & Bronfenbrenner, 1991; Neisser, 1991; Stein, 1997).

The aim of this article is to reconsider Freud’s legacy, not by arguing about the validity of 1920s psychoanalysis but by considering the relevance of contemporary psychodynamic theory for psychological science in the 21st century. The article begins by presenting five core theoretical tenets that define current psychodynamic thinking and briefly considers the empirical evidence with respect to their validity. Although all of these propositions trace their lineage to Freud and were important to the way he understood the mind, Freud undoubtedly would have identified other propositions he considered central as well, such as his drive theory. These five tenets, however, are the psychodynamic propositions that have best stood the test of time, as reflected in their widespread acceptance among psychoanalysts and psychodynamically oriented clinicians and theorists a century after Freud began writing. The article concludes by illustrating the way psychological science might be enriched by incorporating some of the insights that have emerged from 100 years of psychoanalytic inquiry, using as examples research in social cognition and models of parallel distributed processing in cognitive science.

Will the Real Psychoanalysis Please Stand Up? Five Postulates That Define Contemporary Psychodynamic Theory

Psychoanalysis was once a single theory, identified with its founder and his particular ideas, so that summarizing its basic tenets was once less problematic. Today the situation is different, with no single theory dominating even the mainstream psychoanalytic journals let alone the thinking of those who consider themselves more broadly psychodynamic. Nevertheless, all psychodynamic theorists generally adhere to five propositions. First, and most central, much of mental life—including thoughts, feelings, and motives—is unconscious, which means that people can behave in ways or develop symptoms that are inexplicable to themselves. Second, mental processes, including affective and motivational processes, operate in parallel so that, toward the same person or situation, individuals can have conflicting feelings that motivate them in opposing ways and often lead to compromise solutions. Third, stable personality patterns begin to form in childhood, and childhood experiences play an important role in personality development, particularly in shaping the ways people form later social relationships. Fourth, mental

² References to these books are available from the author upon request. I do not reproduce them here, because I have published an introductory text myself and do not want to derogate what are otherwise excellent texts (not consciously, anyway—but more on that later).

representations of the self, others, and relationships guide people's interactions with others and influence the ways they become psychologically symptomatic. Finally, personality development involves not only learning to regulate sexual and aggressive feelings but also moving from an immature, socially dependent state to a mature, interdependent one.

Before I review the empirical data for each of these propositions, two potential objections require consideration. The first is that these five propositions may not adequately represent contemporary psychodynamic thinking. Psychoanalytic theorists are not all of one mind, and distilling a common core to a wide range of often-competing theoretical formulations is no simple task. Isolation of these five tenets no doubt reflects the systematizing efforts of the author, who is an active researcher as well as a clinician and whose thinking is heavily influenced by research in a number of subdisciplines and not just by psychoanalytic theory and clinical observation. Nevertheless, these propositions were all once highly disputed in psychology and were exclusively associated with psychoanalysis. At the very least, they represent five important tenets of psychoanalytic theory even if not the five most central. Recent survey data suggest, however, that these propositions are indeed central to contemporary thinking among practicing psychodynamic psychologists and psychiatrists.³

A second objection regards the extent to which the propositions outlined here, and the data that support them, are in fact distinctively psychodynamic. Many developmentalists, for example, would agree that childhood experiences play an important role in shaping personality, and most cognitive-experimentalists now accept the importance of implicit (unconscious) processes. Further, many of the studies that support these propositions have been conducted by researchers with little interest in or knowledge of psychodynamic ideas. Perhaps the propositions that have obtained empirical support are simply analogous to but not isomorphic with psychodynamic ideas, and little is to be gained by taking a second look at psychodynamic theory.

To dismiss the approach to the mind that Freud inaugurated with the assertion that nothing about these propositions is or ever has been unique to psychoanalysis is, however, to engage in an impressive act of revisionist history. This can be readily seen with respect to the proposition that much of mental life is unconscious. Freud was not the first to notice unconscious processes; poets and philosophers beat him to it. He was, however, the first to build a systematic psychological theory on this proposition, which was attacked vociferously by psychologists of nearly every persuasion for almost a century. Until the mid-1980s, psychodynamic psychologists were alone among their colleagues in arguing for the importance of unconscious thoughts, feelings, and motives. They remain alone among clinicians in attempting to address these processes systematically in psychotherapy, a state of affairs that I believe will shift once the implications of the last decade of research in cognitive neuroscience become more apparent in the clinical literature.

With respect to unconscious (implicit) processes, the historical record is quite clear. As the most comprehensive experimental alternative to psychoanalysis, behaviorism dominated academic psychology (particularly in the United States) through the 1950s and rejected the notion that unconscious processes (or even conscious processes) could play any causal role in

human behavior. The successor to behaviorism in experimental psychology, cognitive science, held to a serial processing model of cognition, in which memories of past experiences only become significant once they enter short-term memory (a synonym for consciousness), until the late 1980s. This was fully a century after Freud's first attempts to describe the influence of unconscious processes on thought, emotion, and behavior. In 1987, Kihlstrom heralded the existence of the *cognitive unconscious*. However, as will be seen, less than 10 years passed before researchers began to discover that the same principles that apply to cognition operate with implicit (or unconscious) affective and motivational processes. So the cognitive unconscious became the *psychological unconscious* (Kihlstrom, 1990) and is rapidly becoming the cognitive-affective-motivational unconscious.

Is this new unconscious nothing but a 1900 Viennese wine in a 1990s bottle? Of course not—it comes from a different tradition and a different set of methods, and it emerged a century later. Does it bear a strong resemblance to the cognitive-affective-motivational unconscious of contemporary psychodynamic theorists and clinicians (e.g., Brenner, 1982; Sandler, 1987), who have continued bottling a distinctive blend of unconscious processes for decades while decreasing the content of

³ To test the centrality of these tenets to contemporary psychodynamic clinicians, I recently surveyed 150 randomly selected members of the American Psychiatric Association and of three clinical divisions (12 [now known as the Society of Clinical Psychology], 29, and 39) of the American Psychological Association who indicated on a previous survey that their primary theoretical orientation was primarily psychodynamic-psychoanalytic. Of these, 86 returned the survey, representing a 57% response rate. All participants were practicing clinicians with an average of 19.42 years of experience postlicensure. Slightly over half were psychologists, and 34% were psychoanalysts. Respondents were presented with 10 theoretical statements about personality and psychopathology and were asked to rate each one on a Likert scale from 1 to 7, where 1 = *strongly agree* and 7 = *strongly disagree*, and to rank the statements in order to indicate the extent to which they agreed with them. The statements included versions of the five propositions presented here as well as five major theoretical propositions central to Freudian thinking, such as the importance of the Oedipus complex, Freud's dual-instinct theory of motivation, psychosexual theory, and so forth. For both ratings and rankings, clinicians endorsed every one of the five propositions more strongly than every other one of the propositions, which were taken from Freudian theory and current textbook coverage of psychoanalysis, at $p < .0001$. The same patterns held when the responses of (a) psychologists and psychiatrists and (b) psychoanalysts and nonanalysts were considered separately. As a second index of the extent to which psychodynamically oriented psychologists and psychiatrists share a core set of beliefs, the ranking data were subjected to Q-factor analysis, a statistical clustering procedure that transposes the factor matrix so that participants, rather than items, are factored (see Block, 1978). This allows the researcher to determine whether respondents cluster into groups based on their response profiles. The results were striking: 45 of the 63 clinicians who provided ranking data loaded on a "contemporary psychodynamic" Q factor defined by the five statements described here as central to contemporary psychodynamic theory. This Q factor accounted for 68.1% of the variance. No other Q factor included more than 4 respondents. Thus, the data show a surprising amount of agreement among contemporary psychodynamic psychologists, psychiatrists, and psychoanalysts in their core beliefs about personality and psychopathology.

drive theory and sexuality that characterized wine with a more Freudian bouquet?

Those familiar with both literatures will recognize that it does, although both approaches to unconscious processes could be substantially enriched by attention to theory and data produced by the other. On the one hand, psychodynamic theory continues to contain problematic residues of Freud's model of the unconscious, which (a) linked unconscious processes inextricably to primitive, instinctual, and emotional processes; (b) failed to distinguish a variety of different kinds of unconscious processes (particularly cognitive ones); and (c) failed to recognize the extent to which some unconscious processes can be adaptive and learned (Westen, in press-b). On the other hand, the unconscious of cognitive experimentalists tends to be the *comfortable unconscious*: automatic, cold (though steadily warming up), cognitive, and unconscious only by virtue of mental architecture. As the data to be described below will make amply clear, this is only a subset of unconscious processes, and attention to the more affectively "hot" subset described for a century by psychodynamic theorists and clinicians would provide a more balanced, comprehensive, and ecologically valid portrayal of how the mind works. Psychoanalytic theorists have been operating from a theory of parallel processing for a century, and many aspects of the parallel architecture they have proposed—notably those relating to affect and motivation—have not yet been incorporated into contemporary connectionist models and will not likely be integrated without explicit attention to psychodynamic constructs and clinical data. The situation is no different with the other four propositions to be examined here, all of which have been central to psychodynamic thinking since at least 1914, were once vehemently contradicted by competing theories, and now have substantial empirical support.

The Existence and Centrality of Unconscious Processes

The most important proposition that has distinguished psychoanalysis from other theoretical systems since its inception is its postulation of unconscious mental processes. Freud (1926/1953c) considered this the cornerstone of psychoanalytic theory. The concept of "the unconscious" was not novel to Freud and was swirling around the intellectual air he breathed in the 19th century, particularly in Germany (see Ellenberger, 1970; J. Weinberger, in press). The German idealist philosophers postulated a realm of the unconscious as early as the beginning of that century, infusing it with mystical elements that were later appropriated by Jung, such as the view that a single Will is immanent in all living things and is expressed in unconscious motives. Schopenhauer (1883/1958) identified this Will with reproduction of the species, whereas Nietzsche (1956) focused on power as the unconscious driving force behind human behavior. Freud divorced unconscious processes from their religious and philosophical underpinnings, schematized them, offered a theory of their dynamics, and linked this theory to data from the consulting room. Ironically, the linkage of a theory of unconscious processes to data was one of the main features that distinguished Freud's from earlier views of the unconscious; however, psychologists who embraced a positivist-empiricist philosophy of science were never enamored of the kind of data upon which Freud relied (J. Weinberger, in press).

Until the 1980s, psychoanalysis was alone among psychological theories in its postulation of unconscious mental processes, although such processes had played some part in the history of psychology since Helmholtz's (1863/1971) concept of *unconscious inference* involved in perception. Freud (1900/1953b) initially emphasized unconscious wishes, but he later distinguished a variety of unconscious processes (Freud, 1915/1957c), and his followers expanded upon the notion that unconscious fantasies (by which they mean affect-laden beliefs) and unconscious mental representations play a central role in human behavior (Arlow, 1991; Sandler & Rosenblatt, 1962; J. Weinberger, in press). Today, the proposition that many cognitive processes are carried out unconsciously (Kihlstrom, 1987) is as widely accepted by experimental psychologists as the opposite proposition (i.e., that such processes do not exist) was by their predecessors less than 2 decades ago. I suspect, however, that many cognitive scientists would be wary of extending the notion of unconscious processes to affect and motivation and would be particularly dubious of the hypothesis that affective considerations can bias the way thought is assembled outside of awareness (the concept of defense). In this section, I examine the data supporting the proposition that much of mental life, including thoughts, feelings, and motives, is unconscious.⁴

Unconscious Thought and Memory

I will be brief in describing the literature on unconscious cognitive processes, because it is no longer controversial and much of it has been reviewed elsewhere (Holyoak & Spellman, 1993; Roediger, 1990; Schacter, 1992; Schacter & Buckner, 1998; Squire, 1987). For years, cognitive psychologists did not specify whether the processes they were describing were conscious or unconscious, although they assumed a serial architecture in which information entered sequential memory stores and was retrieved and manipulated in short-term memory (which was equated with consciousness). The role of consciousness has received much more attention since the discovery of implicit memory, which refers to memory that is observable in behavior but is not consciously (explicitly) brought to mind.

One kind of memory that can be expressed implicitly is procedural memory, "how-to" knowledge of procedures or skills useful in various activities, such as tying a shoe or driving a car. Another kind of implicit memory emerges in priming experiments, in which prior exposure to the same or related information facilitates the processing of new information, whether or not the prime was originally even conscious. For example, presenting the word pair *taxi/cab* in the unattended channel using a dichotic listening paradigm renders individuals more likely to use the less preferred spelling of the auditorially presented homophone *fare/fair*, even though they have no recognition memory for the word pair (see Nisbett & Wilson, 1977; Schacter, 1992). Research in cognitive neuroscience has now documented that implicit memory and explicit memory (conscious recognition or recall) involve different neural mechanisms (Schacter, 1995; Squire & Zola-Morgan, 1991).

⁴ For a more exhaustive summary, see Westen, 1998; implications of these data for psychoanalytic theory are discussed in Westen, in press-b.

Various literatures on thinking have similarly come to distinguish implicit and explicit thought and learning processes (Holyoak & Spellman, 1993; Jacoby & Kelly, 1992; Kihlstrom, 1990; Lewicki, 1986; Reber, 1992; Seger, 1994; Underwood, 1996). As with research on memory, until very recently psychologists paid little attention to the issue of consciousness when studying mechanisms involved in problem solving, decision making, and other cognitive tasks. In the last few years, this has begun to change as researchers have begun to recognize the extent to which thought is guided by implicit grammars that guide performance in tasks ranging from decoding or producing sentences to standing an appropriate distance from another person (as culturally defined) or producing appropriate notes in harmony with music playing on the radio. For example, Rubin, Wallace, and Houston (1993) found that participants asked to compose a ballad after hearing a series of ballads could follow twice as many rules used in their composition as they could consciously articulate.

Unconscious Affective Processes

The existence of unconscious cognitive processes, which were seen as the province of psychoanalysis just a decade ago, is now taken for granted by most cognitive scientists. What remains distinctive about the psychodynamic perspective is the view that affective and motivational processes can be unconscious as well. Logically, the assumption that cognition can be unconscious but affect and motivation must be conscious makes little sense. We have no reason to assume a parallel architecture for cognition but a serial architecture for emotion and motivation. Conscious emotions and motives do not "come out of the blue" any more than conscious thoughts do, and they often include or reflect cognitive components (such as attributions or interpretations) that presumably are assembled outside awareness, as are other cognitions. From an evolutionary perspective, an organism that had to reflect on every decision would be at a severe adaptive disadvantage relative to an animal that could rely on prior learning about the affective significance of various stimuli and produce a rapid response. In fact, several independent lines of research suggest that the *cognitive unconscious* includes only a subset of unconscious processes, notably those that are most automatic, least intentional, and most comfortable to discuss with one's mother.

Neurological evidence for unconscious emotional responses. Some of the best documented early examples of unconscious affective processes came from the study of Milner's famous patient, H. M. (Milner, Corkin, & Teuber, 1968). Because of hippocampal damage, H. M. lost the capacity to consolidate new explicit declarative memories. However, he continued to demonstrate the capacity for *affective learning* despite his deficits in explicit memory. For example, following a visit to his mother in the hospital, H. M. could remember nothing of the visit but "expressed a vague idea that something might have happened to his mother" (Milner et al., 1968, p. 216). Johnson, Kim, and Risse (1985) reported similar findings with patients suffering from Korsakoff's disorder, who showed a preference for melodies they had heard five minutes earlier (reflecting the mere exposure effect, the tendency to prefer familiar stimuli; Zajonc, 1968) despite their impaired recognition memory for the

melodies. Patients with Korsakoff's also had difficulty recalling information presented to them about two fictional characters but preferred the one who had been associated a week earlier with positive attributes. This suggests that the neural circuitry for affective associative learning is distinct from that for conscious declarative memory.

Other research with neurologically impaired patients points in the same direction. Patients with bilateral hippocampal lesions, who have difficulty with explicit memory, can develop conditioned emotional responses to aversive stimuli even though they cannot consciously learn the connection between the conditioned stimulus and an aversive unconditioned stimulus. In contrast, patients with an intact hippocampus but bilateral lesions to the amygdala show deficits in emotional conditioning even though they are conscious of the link between the conditioned and unconditioned stimulus (Bechara et al., 1995). In other words, explicit memory in these patients is intact, but implicit affective learning is impaired. These data are consistent with LeDoux's (1989, 1995) finding of two neural pathways for emotion: one, implicated in conditioned emotional responses, in which primitive perceptual information is relayed via the thalamus to the amygdala (which attaches an affective valence to the information) without any involvement of consciousness, and the other, in which the thalamus relays information to the cortex, which processes the information more deeply before activating the amygdala.⁵

Similarly, individuals with prosopagnosia, who lose the capacity to discriminate faces consciously (a form of explicit knowledge), may nevertheless show differential electrophysiological responses to familiar versus unfamiliar faces (Bruyer, 1991). Analogous findings have been reported in patients with visual neglect, who ignore a region of the visual field. In one study, the investigators presented pictures of two houses to patients with visual neglect (Halligan & Marshall, 1991). In one of the pictures, the left half of the house was on fire. The patients denied any difference between the two houses—consciously neglecting the image on the left—but chose the house without the fire when asked which one they would prefer to live in. Research similarly finds that split-brain patients presented with affectively evocative visual stimuli to the right hemisphere may show appropriate affective responses but be unable to offer any verbal explanation for them (Gazzaniga, 1985).

These neurological data are probably of relevance to the argument advanced by Zajonc (1980) that preferences can occur without inferences. For example, W. R. Wilson (1975) presented tone sequences to participants in the unattended channel in a dichotic listening experiment. Although participants showed no recognition memory for tone sequences they had heard as many as five times, they reported liking the tone sequences they had heard better than those they had not (the mere exposure effect). In other words, they were developing affective preferences outside of awareness toward stimuli they had never consciously registered. Murphy and Zajonc (1993) found that subliminal presentation of positive or negative faces similarly affected participants' liking or disliking of novel stimuli. Experiments with

⁵ This should not lead to the common assumption that the latter pathway necessarily involves consciousness. Most cortical processes are not consciously accessible, either.

subliminal procedures have shown comparable effects on attitudes toward various stimuli, including the self (see Bargh, 1997; Eagle, 1959). More recently, Murphy, Monahan, and Zajonc (1995) have combined these lines of research (exposure and priming), demonstrating that subliminal mere exposure effects and subliminal priming effects are additive: Increasing exposure leads to increased ratings of liking for Chinese ideographs, and priming with a positive or negative stimulus (a happy or sad face) simply adds or subtracts a constant (that is, increases or decreases liking ratings the same amount at each level of exposure). Interestingly, explicit (1 s) priming does not have the same effect as implicit (4 ms) priming, because participants recognize the manipulation and appear to counteract it. Perhaps the most important contribution of this research is that it demonstrates unequivocally that affective evaluations can develop unconsciously and that multiple influences on affective associations can be combined outside of awareness. As we will see, this finding fits well with a psychodynamically informed connectionist model that integrates affective and motivational processes with the more familiar cognitive and perceptual ones.

Conditioning and unconscious affect. A second, and related, source of data on unconscious affect comes, paradoxically, from research with conditioning paradigms. Lazarus and McCleary (1951) paired nonsense syllables with a mild electric shock and then presented the conditioned stimuli to participants subliminally. The conditioned stimuli reliably elicited a galvanic skin response (GSR) even when presented below the threshold of conscious recognition. Thus, a conditioned stimulus can elicit affect, as assessed electrophysiologically, even when presented outside of awareness. Numerous other studies have produced similar results (see Ohman, 1994; J. Weinberger, in press; Wong, Shevrin, & Williams, 1994) with dependent variables ranging from skin conductance to facial electromyography (EMG, which measures facial muscle indicators of emotion) to evoked-related brain potentials (ERPs).

Other studies show that classically conditioned emotional responses can be not only elicited but acquired without consciousness (e.g., Bunce, Bernat, Wong, & Shevrin, 1995; Esteves, Dimberg, & Ohman, 1994). For example, faces presented subliminally can become associated with an aversive stimulus (electric shock). The conditioned response is evidenced in facial EMG and evoked potentials even though the person reports no conscious awareness of the contingency between conditioned and unconditioned stimuli (Bunce, Bernat, Wong, & Shevrin, 1995; Wong, Bernat, Bunce, & Shevrin, in press). In another study, a conditioned auditory stimulus paired with electric shock while rats were unconscious (anesthetized) produced a conditioned response 10 days later (Weinberg, Gold, & Sternberg, 1984; for similar research on nausea, see Garcia & Rusiniak, 1980). In yet another study, dental patients showed affective learning while anesthetized with nitrous oxide but not with Novocain (Hutchins & Reynold, as cited in Leventhal & Everhart, 1979). Whereas Novocain effectively blocked the experience and encoding of pain signals, nitrous oxide apparently blocked consciousness of pain but did not prevent implicit memory for the experience. Subsequent research has demonstrated other kinds of learning that can occur under general anesthesia (e.g., Cork, 1996).

Behavior therapists in the 1970s who believed they had

“cured” homosexuality in male patients subsequently discovered that their patients had suppressed the conscious response while remaining physiologically aroused by pictures of naked men, as demonstrated by genital plethysmography (which measures sexual arousal in males by measuring degree of erection; McConaghy, 1976). These findings echoed other research demonstrating that suppression of the subjective experience of emotion does not eliminate the psychophysiological component of the emotion (Rachman, 1978). Presumably, this component could continue to exert an impact on behavior despite the absence of conscious affect.

Unconscious affect and attitudes. Social psychologists studying attitudes and prejudice now recognize the importance of distinguishing conscious and unconscious attitudes (see Greenwald & Banaji, 1995). Social psychologists have traditionally defined attitudes as including not only a cognitive component but an affective–evaluative component (and often a set of behavioral tendencies as well, such as the tendency to vote for candidates with particular ideological agendas). Unconscious attitudes include unconscious affective dispositions, which may be activated automatically and without conscious awareness. Fazio (1990) has found that when people are consciously focusing on their attitudes, these attitudes heavily influence their behavior. When they are not focusing on their attitudes, only chronically activated, often automatic, and unconscious attitudes do so. This finding is directly parallel to a similar finding in the motivation literature, reviewed below, that conscious motives guide consciously chosen behavior, whereas implicit or unconscious motives guide behavior over the long run, when consciousness is not directly focused on goals (McClelland, Koestner, & Weinberger, 1989). Petty and Cacioppo’s (1986) work on attitude change distinguishes a central route to attitude change, which involves conscious attention to reasoned arguments, and a peripheral route, which is usually based on heuristics, automatic processes, affective appeals, and primitive evaluative processes that require minimal attention and effort⁶ (see also Chaiken, 1980).

Some of the most convincing research on unconscious affect comes from studies of prejudice (Devine, 1989; Dovidio & Gaertner, 1993; Katz, 1981; Katz & Hass, 1988), which demonstrate that people in the United States who consider themselves nonracist often have two conflicting sets of attitudes that influence their behavior: one explicit and the other implicit. The latter, which are more negative, bias people’s information processing when their attention is not focused on their conscious values and are likely implicated in relatively automatic behavioral responses, such as when people check their wallets after a Black man has passed on the subway.

Of most relevance is research demonstrating that individual differences in unconscious or implicit negative racial attitudes are often uncorrelated with individual differences in conscious

⁶ The fact that attitude models have begun to converge with psychodynamic models is in some respects not surprising, because some prominent models of attitudes (e.g., Devine, 1989; Fazio, 1990) are based on the distinction between controlled and automatic information processing (Schneider & Shiffrin, 1977), which is similar in certain respects to Freud’s distinction between secondary and primary process thought (i.e., rational versus associational and unconscious thought).

racial attitudes. In a landmark study, Fazio, Jackson, Dunton, and Williams (1995) measured implicit attitudes by presenting to participants a series of Black and White faces followed by either a positive or negative adjective. The participants' task was to press a key indicating the affective connotation of the word (good or bad). Because negative attitudes toward Blacks should facilitate (prime) responses to negative adjectives, response latency to negative words following priming with a Black face can be used as a measure of the affective quality of implicit attitudes—that is, the association of affects with representations of Blacks. The investigators found that this measure of individual differences in implicit attitudes predicted an implicit behavioral index—the extent to which a Black confederate of the experimenters rated participants as friendly and interested in their interaction with her when she debriefed them about the study—but did not predict conscious attitudes about current events involving racial issues. In contrast, a measure of conscious racism predicted participants' responses to these conscious attitude questions but not their behavior with the Black confederate.⁷ Similar findings emerge with gender stereotypes: Implicit and explicit attitudes toward gender are often only minimally correlated, if at all (Banaji & Hardin, 1996).

Other studies documenting unconscious emotional processes. A number of other literatures document unconscious affective processes (see, e.g., Niedenthal & Kitayama, 1994). Women high in self-reported sexual guilt report less arousal but show greater physiological arousal (as assessed by genital plethysmography) than those low in sexual guilt while watching an erotic videotape (Morokoff, 1985). Research on hypnotic analgesia often finds that physiological indexes of pain show persistence of pain despite conscious self-reports and consciously controlled behavior (such as keeping a hand immersed in ice water) indicative of minimal pain (Hilgard, 1979). Research on excitation transfer shows that although participants gradually lose awareness of physiologically detectable residual arousal following vigorous exercise, they subsequently respond with increased aggression or sexual excitement (depending on the stimulus) when presented with anger-arousing or erotic stimuli during this postawareness phase (Zillman, 1978). Thus, they are acting on arousal of which they are unaware.

In a classic New Look study, participants more readily perceived neutral than taboo words presented briefly on a screen and showed higher skin conductance responses (GSRs) for the taboo words prior to conscious recognition of them (McGinnies, 1949). These findings, which not only replicated but proved robust in the face of numerous rival hypotheses (see Broadbent, 1977; Dixon, 1971, 1981; Erdelyi, 1974, 1985), suggest a pre-conscious stage of processing in which information is evaluated for its affective content, a position similarly arrived at by Bargh (1997). Other researchers (as cited in Shevrin & Dickman, 1980) have discovered differences in amplitude of brain ERPs in response to emotional versus neutral words presented subliminally. In one study, emotional words evoked more alpha waves as assessed by electroencephalograph (EEG) than did neutral words even when presented at luminance levels that rendered them consciously imperceptible, which suggests that their emotional content was processed prior to their conscious recognition (Heinemann & Emrich, 1971). More recently, Shevrin and his colleagues (Shevrin, Bond, Brakel, Hertel, & Williams, 1996)

have been using brain wave activity to examine the impact of subliminal presentation of words selected (on the basis of extensive interview and projective data) by a team of clinicians as relevant to patients' symptoms. Silverman and colleagues (Silverman & Weinberger, 1985; J. Weinberger, in press) have demonstrated that subliminal presentation of stimuli hypothesized to be psychodynamically meaningful can affect a wide range of behavior. Despite the widely held perception that such findings have only emerged in Silverman's laboratory, a meta-analysis of over 100 studies conducted by numerous researchers documented a modest but robust effect of subliminal stimulation of this sort; supraliminal stimulation often does not produce the same effect (J. Weinberger & Hardaway, 1990).

Also of relevance is research by Wegner (as summarized in Wegner, 1992) on thought suppression. Using such simple manipulations as instructing participants not to think about a white bear, Wegner has demonstrated that the act of suppression instigates not only a conscious control process in which participants actively search for distractors but also an automatic, unconscious search process aimed at detection of the word to be suppressed. When the automatic process detects the target word (e.g., while participants are asked to think aloud or complete a word-association task), it activates the conscious distractor process. The automatic search process, however, has the unintended effect of keeping the to-be-suppressed thought activated unconsciously. Blum (1954) demonstrated a similar phenomenon in which both the vigilance and suppression processes occur outside of awareness. He exposed participants to threatening and nonthreatening visual stimuli at speeds that rendered them in one condition far below and in another condition near the threshold of conscious perception. When asked which stimuli "stood out" most clearly at extremely brief stimulus exposures, participants indicated that the anxiety-provoking images were more salient, although they could not report what they had seen. At longer exposures, however, neutral stimuli were more easily perceived; that is, anxiety-provoking stimuli took longer to recognize consciously.

Of particular relevance to the current discussion is the finding that when people are instructed to suppress an exciting thought about sex, they remain psychophysiologicaly aroused even while the thought is outside awareness—as aroused, in fact, as participants instructed to think about the sexual thought (Wegner, Shortt, Blake, & Page, 1990). Unlike the latter participants, however, those instructed to suppress the thought do not habituate to it, so that when it returns to their consciousness, they show physiological arousal again, unlike participants who have kept it in mind the entire time. This suggests, much as Freud did, that affect-laden thoughts kept from consciousness may continue to have an affective press.

Unconscious affect and defensive processes. The studies

⁷ Curiously, Fazio and colleagues (1995), like many cognitive social psychologists working in this area, did not conclude that they had elicited or measured unconscious affect, although it seems highly unlikely that participants with implicitly negative but explicitly positive attitudes toward African Americans were aware of activation of negative affect while they were unwittingly sending negative signals to the Black confederate. At the very least, however, the results clearly indicate that implicit and explicit affective associations are uncorrelated.

presented thus far on unconscious affect provide particularly compelling evidence for a central hypothesis that has been propounded only by psychoanalytic theory and has guided psychoanalytic clinical work for a century: People can feel things without knowing they feel them, and they can act on feelings of which they are unaware, as in subtly hostile, indifferent, or defensive treatment of members of ethnic minority groups (such as gratuitous, defensive smiles that members of these groups immediately recognize as nongenuine) by people who believe they harbor no ill feelings toward them. Psychoanalytic clinicians have attended to such signs of implicit affect for decades by observing both nonverbal behavior (such as facial expressions, sighing, blocking, shifting posture, etc.) and verbal behavior (such as sudden changes in syntax, shifts in topic, disorganization in otherwise coherent narratives, and word use that seems stilted or idiosyncratic). A discussion of unconscious affect invariably leads to literatures pertaining to another distinctively psychodynamic construct: psychological defense.

The most important research in this area has been conducted by Vaillant and colleagues, who adapted Haan's (1977) defense Q sort to study two longitudinal samples (Roston, Lee, & Vaillant, 1992; Vaillant, 1977, 1992). Vaillant has shown that reliably scored defenses, arranged according to four levels of adaptiveness (from grossly maladaptive defenses, such as blatant denial, through more mature ways of dealing with discomfort, such as humor), have a number of predictable correlates, both longitudinally and cross-sectionally. For example, Vaillant and Drake (1985) found strong associations between level of defense maturity and independently rated measures of psychological health-sickness and presence of a personality disorder. A different methodology has produced similar results (Perry & Cooper, 1989).

Other researchers have tried to operationalize defense mechanisms empirically as well (Bond, Paris, & Zweig-Frank, 1994; Hilevich & Gleser, 1986; Paulhus, Fridhandler, & Hayes, 1997; Perry & Cooper, 1987). For example, Hauser and colleagues (Hauser, Borman, Jacobson, Powers, & Noam, 1991) have found links between coping and defense mechanisms in adolescents and their parents' level of ego development as assessed by Loevinger's (1985) Sentence Completion Test. K. Davidson and MacGregor (1995) found, as predicted, that overall degree of defensiveness as assessed by observers during an interview moderates the discrepancy between self-reported and informant-reported neuroticism. The correlation between self- and informant reports for low-defensiveness participants was moderately positive, whereas the correlation for high-defensiveness participants was strongly negative.

Westen, Muderrisoglu, Fowler, Shedler, and Koren (1997) assessed the reliability and validity of a Q-sort measure of affect regulation that includes unconscious defensive and conscious coping strategies. Factor analysis of clinician descriptions of 90 patients yielded three affect regulation factors. The first, labeled adaptive regulation, is defined by the poles of *active coping* versus *acting impulsively*. People high on this dimension tend to use active coping strategies, such as anticipating problems and seeking out information, whereas people low on this dimension use maladaptive defenses and behaviors, such as dissociating and using drugs and alcohol. The second factor, externalizing defenses, is defined by the poles of *blaming others* versus *blam-*

ing the self. Individuals high on this factor deny responsibility for their own problems and brag or dwell on their successes to bolster flagging self-esteem, whereas those who are low on this factor have difficulty expressing or acknowledging anger, tend to feel bad or unworthy instead of feeling appropriately angry at others, and remain passive in the face of distress. The third factor, avoidant defenses, is defined by the poles of *avoiding consciousness of unpleasant affect* versus *containing affective leakage*. People who are high on this factor tend to avoid thinking about distressing experiences consciously and to think in intellectualized or abstract terms about emotion-laden events, whereas people low on this factor find themselves constantly trying to contain breakthroughs of distress, vacillating between clinging to others and pushing them away, expressing distress in the form of physical symptoms, and ruminating when distressed. Interrater reliability from clinical research interviews is relatively high ($r = .78$), and factor scores predict relatively objective data such as capacity to maintain employment, history of psychiatric hospitalization, and history of suicidality, as well as diagnosis and clinician ratings of adjustment.

A number of studies have added considerably to the literature on defensive processes by using experimental, rather than solely correlational, methods. For example, positivity of participants' self-descriptions increases following a threat manipulation, which suggests defensive alteration of conscious self-representations (Paulhus & Levitt, 1987). Cramer (1996) has developed a measure of three defenses—projection, denial, and identification—for use with Thematic Apperception Test (TAT) responses. In one study, experimentally inducing anger led to increases in projection and identification (Cramer, 1991). A different projective measure of defense was used by Hedegard (1969), who experimentally manipulated anxiety using hypnosis and found that more intense anxiety predictably evokes less mature defenses, as predicted by theories that view defenses as hierarchically organized (A. Freud, 1936; Vaillant, 1977). Other researchers have used cognitive or perceptual tasks to measure defensive processes experimentally (see Erdelyi, 1990; G. J. W. Smith & Westerlundh, 1980).

Numerous social psychological investigations have documented defensive processes as well (see Westen, 1994). Pyszczynski, Greenberg, and Solomon (1998) have demonstrated in dozens of studies that making people more aware of their mortality (typically by having them complete a mortality salience questionnaire) leads them to respond defensively in a number of ways even though they have no awareness of either the affect that triggered their responses or its effects on their conscious decisions or behavior (see, e.g., Simon et al., 1997). Along different lines, L. S. Newman, Duff, and Baumeister (1997) found support in a series of studies for an ingenious theory about the mechanisms by which one defense, projection, occurs. Drawing on Wegner's (1992) work on thought suppression, they found that people who avoid thinking about threatening aspects of themselves and have a tendency to avoid awareness of their feelings become chronically vigilant toward precisely those traits they want to deny; this chronic accessibility leads them to use those same trait constructs when making inferences about other people. Although they used the descriptive language of self-regulation rather than of defense, Bandura and colleagues (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996) showed

that children who use externalizing defenses—that is, who endorse items such as “Slapping and shoving someone is just a way of joking” and “Kids cannot be blamed for using bad words when all their friends do it”—are more likely to be physically aggressive and less likely to behave prosocially than children who do not reframe transgressions to avoid responsibility. Other research has found that members of couples defensively fail to recognize their partner's attraction to another person to the extent that (a) the relationship is important to them, (b) they are insecure about its stability, and (c) the potentially threatening other is attractive (Simpson, Ickes, & Blackstone, 1995).

The classic psychodynamic defense hypothesis of prejudice—that one function of stereotyping is to bolster self-esteem by derogating outgroups—has recently received experimental support in a series of studies in which manipulations that affirmed valued aspects of self or threatened self-esteem led to predicted decreases or increases in prejudiced responding (Fein & Spencer, 1997). A recent study with genital plethysmography has breathed new life into the classic psychoanalytic theory of homophobia as a defense against threatening homosexual feelings (Adams, Wright, & Lohr, 1996). Participants identified by questionnaire as homophobic, unlike nonhomophobic comparison participants, showed increases in penile circumference (indicating arousal) while exposed to sexually explicit videotapes showing male homosexual activity. Although one could attempt to explain these data in other ways—for example, suggesting that anxiety, novelty, or surprise could lead to penile arousal—the more parsimonious explanation of this and similar electrophysiological findings reviewed below is that people can be unaware of, and defend against, things they find threatening, including their own feelings.

Of particular relevance is the literature on self-serving biases and more recent empirical outgrowths of it on narcissism. For years, researchers have documented numerous self-serving biases, such as the tendency to see oneself as above average on positive characteristics such as intelligence (when, of course, not everyone can be above average), to overrate one's role in group projects with positive outcomes, and so forth (see Dunning, Leuenberger, & Sherman, 1995; Epstein, 1992; Greenwald & Pratkanis, 1984). More recent research has begun to track down individual differences in the tendency to see ourselves unlike others see us, and has found, as clinical observation suggests, that narcissistic people tend to hold defensively grandiose views of themselves and their accomplishments and that this is not without substantial social and personal cost. In one study, MBA students ranked themselves and their peers on their contribution to a group problem-solving task, as did a group of psychologist observers (John & Robins, 1994). Participants' rankings of their peers were remarkably consistent with the psychologists' rankings, but their self-rankings correlated with peer and psychologist rankings of them at only about $r = .30$; 60% overestimated their own performance, suggesting a self-serving bias. Participants who showed the most substantial self-serving biases were significantly more narcissistic by both observer report and self-report. Indeed, the tendency of participants to self-enhance in this study correlated around $r = .50$ with psychologists' ratings of their narcissism.

A longitudinal study compared two groups of 1st-year college

students who were matched in level of ability on the basis of high school grades and Scholastic Assessment Test (SAT) scores (Robins & Beer, 1996). One group was strongly self-enhancing; their perceived (self-reported) level of academic competence was much greater than their actual past performance (assessed from records in the admissions office). The other group was relatively accurate in assessing their own abilities. At the end of their sophomore year, the self-enhancers, who had expected much greater academic success than they had achieved, reported significantly higher subjective well-being. A behavioral measure, however, suggested otherwise: They were 32% more likely to have dropped out of school.

Other research demonstrates that people whose views of themselves are overly favorable, relative to reports by independent observers or peer informants, show numerous psychological and social difficulties, both longitudinally and cross-sectionally (Colvin, Block, & Funder, 1995). For example, men who were highly self-enhancing at age 18 were described by observer Q sorts at age 23 as having fluctuating moods, being deceitful and distrustful, and having brittle defenses. Low self-enhancers, in comparison, were described as cheerful, straightforward and forthright, and dependable. (The data are not yet in on whether some degree of self-enhancement, accompanied by “positive illusions” [Taylor & Brown, 1988] that foster hope and effort, is adaptive.) Studies of leadership (summarized in Hogan, Curphy, & Hogan, 1994) similarly have found that leaders who are narcissistic (characterized by traits such as arrogance, vindictiveness, and selfishness) tend to fail despite the presence of other traits typically associated with good leadership, such as intelligence, perseverance, and ambition. Interestingly, these leaders are difficult to detect by self-report, because they present themselves as confident and high in self-esteem.

Defense against unpleasant emotions and its physiological correlates. Several other literatures bear on psychological defense and particularly on the hypothesis that people can prevent themselves from consciously experiencing affect as a way of trying to manage unpleasant feeling states. The literature on adult attachment demonstrates that people inhibit conscious access to representations of the self, others, and relationships on the basis of their affective qualities. Unlike adults with secure attachment styles, who speak freely and openly about their relationships with their parents, avoidant adults dismiss the importance of attachment relationships or offer idealized generalizations about their parents yet are unable to back them up with specific examples (Main, Kaplan, & Cassidy, 1985). Dozier and Kobak (1992) have produced physiological evidence of the discordance between what avoidant adults know and feel consciously and unconsciously. The researchers monitored electrodermal response while participants were asked to recall memories involving separation, rejection, and threat from their parents. Avoidant adults, like avoidant infants, are hypothesized to shut off or deactivate attachment-related feelings as a way of coping with the distress associated with them. In fact, the more individuals showed avoidant, deactivating strategies by disavowing feelings, the more physiological 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, and Manis (1993) studied partici-

pants in two studies with *illusory mental health*, who reported themselves to be free of psychological distress and symptomatology but whose descriptions of their early memories (a projective measure) were rated as showing signs of psychological disturbance. Participants 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). Those participants who viewed themselves as healthy but showed unconscious evidence of distress in their early memories were significantly more reactive on a measure of cardiac reactivity related to heart disease than participants who were either low or high on both measures of distress. They also showed more indirect signs of anxiety (such as stammering, sighing, and avoiding the content of the stimulus) while simultaneously declaring themselves to be the least anxious during these tasks. A subsequent study found that illusory mental health predicted the number of visits students made to the health center over the next year, as did the amount of negative affect present in early memories, regardless of level of self-reported distress (Cousineau, 1997). Strikingly, self-reported distress, stress, and life events all predicted self-reported visits to the doctor, but none predicted either actual visits or visits that led to a referral from the nurse to a doctor.

Research on repressive coping styles (which refer not to the use of repression but to a tendency to avoid feeling emotions as a way of managing distress) documents a direct link between defensive disavowal of affect, particularly anger, and physical illness (Schwartz, 1990; D. Weinberger, 1992, 1995). Participants characterized by this coping style report low anxiety but have high scores on the Marlowe-Crowne scale (Crowne & Marlow, 1960), which appears to measure some combination of defensiveness, social desirability, and overcontrol of affect. Repressors, like avoidants in the Dozier and Kobak (1992) study and like the participants with illusory mental health in the studies by Shedler, Mayman, and Manis (1993), report low levels of anxiety while demonstrating marked physiological reactivity. They also have difficulty retrieving unpleasant memories (Davis & Schwartz, 1987), as do people with avoidant attachment styles (Mikulincer and Orbach, 1995). Weinberger and his colleagues (D. Weinberger, 1995) have demonstrated a link between repressive coping (particularly suppression of aggressive or angry feelings) and both cholesterol levels and asthma. Individuals with this coping style, like individuals who report high levels of anxiety, also show higher salivary cortisol levels than genuinely low-anxious individuals; this suggests that people with a repressive coping style are hyperreactive to potentially stressful encounters (Brown et al., 1996). Other research has uncovered an association between repressive strategies and vulnerability to cancer (Jensen, 1987; D. Weinberger, 1992). Apparently, inhibiting conscious access to one's emotions places the body, particularly the heart and the immune system, under considerable stress. Freud may be dead, but his theories are proving increasingly useful in predicting who will be joining him sooner rather than later.

These findings converge with a literature that has existed for many years documenting a negative correlation between emotional expressiveness and physiological reactivity (see Gross & Levenson, 1993). In a sample of several thousand medical patients, for example, Schwartz, Krupp, and Byrne (1971) found

that participants who minimized their conscious feelings of anxiety reported more organic problems, whereas those who focused on them reported more psychological problems. A recent meta-analysis found that defensive constriction of emotional experience was the best predictor of essential hypertension (elevated blood pressure of unknown origin) of any personality variable yet studied (Jorgensen, Johnson, Kolodziej, & Schreer, 1996).

A program of research by Pennebaker (1989, 1997) has demonstrated that simply 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). Expressing unpleasant emotion leads to a momentary increase in arousal but a decrease in arousal in the long run (Hughes, Uhlmann, & Pennebaker, 1994), apparently because keeping oneself unaware of what one feels prevents dissipation of the feeling, keeps related cognitions active, and hence maintains the potential for unconscious priming of aversive arousal. (From a clinical perspective, one might add a behavioral loop: Keeping oneself unaware of unpleasant feelings prevents a person from exercising conscious control over situations that might trigger the affect.) 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 18 months relative to control participants matched for stage of the illness (Spiegel, Bloom, Kraemer, & Gottheil, 1989).

What is important about the studies described here is that they demonstrate the existence not only of unconscious affective and motivational processes (unconscious efforts to control aversive affective states) but of what Freud (1915/1957c) referred to as *dynamically* unconscious processes; that is, those that are kept unconscious for a reason. The existence of these processes has long been a central assumption of psychoanalytic theory, an assumption that continues to distinguish it from even contemporary cognitive approaches to unconscious processes (e.g., Kihlstrom, 1987, 1990). Although many researchers have difficulty with the notion that such active, seemingly intentional processes could occur outside of awareness, many of the mechanisms are probably not unlike familiar conditioning processes (Dollard & Miller, 1950; Wachtel, 1997; Westen, 1985, 1994). Just as people can learn to avoid a stimulus associated with pain through negative reinforcement, they can learn to avoid focusing attention on particular cognitive or affective processes because doing so is associated with shame, guilt, sadness, or anxiety. Nothing about the architecture of memory requires that these procedures or their triggers be accessible to consciousness; in fact, most processes that guide attention are not accessible to introspection. In the final section of this article I describe some possible mechanisms through which implicit affect-regulatory procedures of this sort might occur.

At this point, I believe the data on unconscious affective processes are incontrovertible. Considerable affective processing occurs unconsciously in daily life whether or not a person is responding defensively. Conscious affective experience, like conscious cognition, is likely assembled through the action of multiple neural modules operating in parallel. The capacity to respond with automatic affective responses, some of which occur in the absence of conscious recognition of a

stimulus, is highly adaptive and likely guided our ancestors long before they developed the kind of reflective self-awareness characteristic of contemporary humans. Blocking conscious emotional experience carries a cost, because people who chronically keep themselves unaware of their feelings are more likely to suffer from physical disorders such as heart disease. (Readers who remain unconvinced should probably consult their cardiologists.)

Unconscious Motivation

Consciousness, at least in its human form, appears to be a relatively recent evolutionary development superimposed on an information-processing system that worked relatively well for millions of years (Reber, 1992). To assume that consciousness is essential for goal-directed behavior suggests that our pre-conscious protohuman ancestors managed to escape extinction for millennia through simple good luck, despite their lack of motivation, until consciousness felicitously evolved. Much of human behavior is in fact simultaneously motivated by multiple goals, which would disrupt goal-directed behavior if they all had to be represented in consciousness because they would consume too much working memory. As I write these words, for example, I am clearly motivated to make a coherent argument, write grammatically, present studies accurately, accommodate an imagined audience of whom I would expect many to be initially skeptical, present myself as a competent scientist, and act on a host of other less admirable motives that may have expressed themselves despite my best efforts to the contrary. At the very least, motives must be capable of automatization and hence unconscious activation, much as skills are. As shown below, there is now considerable evidence for this last proposition (see Bargh, 1997).

Data on defensive processes simultaneously provide evidence also for the existence of unconscious motivational processes, because 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, speaks even more directly to the phenomenon of unconscious motivation, suggesting that the distinction between implicit and explicit processes applies not only to cognition and affect but to motivation as well. Some of the best evidence comes from research comparing the correlates of self-report and projective measures of motives (see McClelland et al., 1989). The correlation between these two types of measures typically hovers around zero; for example, self-reported and projective assessments of the need for power tend to show no relation to each other, leading adherents of each method to proclaim that the other is obviously invalid. However, each type of measure predicts different kinds of behavior. The correlates of each are highly predictable if one views consciousness as an override mechanism or as a special lens for examining information and choosing courses of action when unconscious standard operating procedures have broken down or require monitoring. For example, over the long run, assessment of motives from TAT stories is much more predictive of entrepreneurial or managerial success than are self-report measures of need for achievement or power, which tend to have little predictive validity. Tell people that they need to achieve on a particular task, however, and their self-reported achievement

motivation will be a much better predictor of their effort and performance than will motives assessed from TAT responses.

In both his own studies and a meta-analysis of objective and projective studies of dependency, Bornstein (1995) has produced similar findings with respect to the construct of dependency: Self-report and projective measures have predictable but different correlates. Peterson and Ulrey (1994) may have uncovered a similar phenomenon in research on explanatory style (the tendency to attribute negative events globally, stably, and internally). Both TAT-based and self-report measures of explanatory style correlated with self-reported depression, but the two measures of explanatory style (one implicit and the other explicit) did not correlate with each other, suggesting that individuals may be pessimistic in their attributions consciously, unconsciously, or both.⁸

These and other data suggest that when conscious motives are activated, they guide behavior. When they are not activated, which is much of the time as people muddle through their lives, unconscious motives guide behavior. This should come as no surprise to people who have broken New Year's resolutions or to cognitive psychologists who assume a similar phenomenon with respect to cognition: Controlled information processing operates when people are focusing attention on a problem or task, whereas automatic information processing—including associative memory, activation of procedural skills, and activation of schemas—guides thought, emotion, and behavior in the absence of consciously focused attention (see Schneider & Shiffrin, 1977).

Bargh (1997; Bargh & Barndollar, 1996) has produced another, quite different, line of research on unconscious motivation, documenting the existence of unconscious motivational processes experimentally. Bargh extends the literature on automatization of cognitive processes (Anderson, 1995) to motives, arguing that well-learned goals can be activated by environmental stimuli—and attendant behavioral plans can run their course—even without conscious awareness. Bargh takes issue with the conception of unconscious processes prevalent in cognitive psychology (e.g., Greenwald, 1992) as simple and irrational. He contends, instead, that the history of a person's learning in a given situation is embodied in habitual and automatic motives. These motives often provide a better guide to behavior than does conscious and presumably rational analysis of a single current instance, which may be ignorant of base rates and prior automatic actions. This supposition accords with research by T. D. Wilson (e.g., T. D. Wilson & Schooler, 1991; T. D. Wilson et al., 1993), which demonstrates that people's "gut level" feelings are often more effective guides to action and lead to more subsequent satisfaction than do their reasoned reflections, which can interfere with emotion-based judgments. Damasio and colleagues (Bechara, Tranel, Damasio, & Damasio, 1996) have obtained parallel findings with patients with ventromedial prefrontal damage, whose reasoning processes are largely intact

⁸ This finding also has potential implications for outcome measures in studies of the efficacy of cognitive therapies for depression, which may produce misleading findings because the treatment is, among other things, a training procedure for altering or disavowing negative conscious cognitions about the self.

but who cannot use prior affective associative learning to guide their responses adaptively.

Bargh suggests that priming procedures that have been shown to influence the way people subsequently categorize or make inferences should be equally capable of influencing their motives and cites evidence from his own and others' laboratories in support of this supposition. For example, researchers presented participants with scenarios in which a protagonist was interested in either accurately assessing a situation or making a good impression (Chaiken, Giner-Sorolla, & Chen, as cited in Bargh & Barndollar, 1996). Then, in a "second study" that appeared to be independent of the first, participants were asked to discuss their opinions about a topic with a partner after being told what the partner's attitudes toward it were. Participants who had been primed in the first "study" with the impression management story were more likely to align their attitude with that of their partner, whereas those in the accuracy condition were unswayed by their partner's alleged position. Thus, simply activating thoughts about two different kinds of motives actually primed the motives.

In an important series of studies paralleling the work of McClelland et al. (1989), Bargh and his colleagues (Bargh, 1997) primed participants with words related to either achievement (e.g., *strive*) or affiliation (e.g., *friend*) in an allegedly unrelated first task. Next, they placed participants in a situation of motivational conflict: Participants worked with an incompetent partner on a puzzle task at which they 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, participants who had been primed with achievement words outperformed participants primed with affiliation words (and control participants), even though upon debriefing they were, not surprisingly, unaware of the potential influence of the primes. In a second study, the same findings occurred, but the manipulation wore off after the first few trials. One of the variables that then predicted success was participants' need for achievement as assessed by the TAT. In other words, after recent activation effects decayed, chronically active motives "kicked in" to control behavior. Similar findings occurred in the study by Chaiken and colleagues (as cited in Bargh & Barndollar, 1996).

What these studies essentially show is that many of the same processes found in research on unconscious cognitive processes, such as the impact of both recently and chronically activated mental processes on thought and behavior (Higgins, 1990), apply to motivation as well. Research on prospective memory—remembering to remember something in the future, such as picking up a few items at the grocery store after work—has shown that intending to carry out an action leads to heightened activation of the information to be remembered below the threshold of consciousness even when the intention is no longer conscious, as evidenced in both explicit and implicit memory tasks (such as reduced response latencies for recognizing to-be-remembered items from a list; Goschke & Kuhl, 1993). In other words, active motives influence ongoing thought and action whether or not they are conscious.

Further data on unconscious motives come from a variety of other sources, including case studies of patients with neurological damage. An early demonstration occurred almost a century

ago when Claparede (described in Cowey, 1991) shook hands with a 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, despite being unable to explain why. Gazzaniga (1985) has described the similar behavior of split-brain patients who can carry out instructions to produce some action presented to their right hemisphere. When subsequently asked what they are doing, they offer seemingly sensible but incorrect rationalizations for their behavior, because the motivation is inaccessible to their right hemisphere.

Similar hypnotic demonstrations, in which participants given a suggestion for posthypnotic amnesia would carry out an action and then try to explain it, were precisely the kind of data that led Freud to his hypotheses about unconscious motivational processes. He was also struck by the fact that hysterical symptoms could be created hypnotically, leaving their bearers as unable to explain them as true hysterics, and that true hysterical symptoms could sometimes be temporarily relieved by hypnotic suggestion (see Erdelyi, 1985). The fact that such hypnotic cures tended to fade may not be unrelated to the fading of priming effects and the ultimate resurgence of unconscious influences on behavior.

Phenomena such as these are not limited to neurological patients, hypnotic subjects, and hysterical patients. Nisbett and Wilson (1977) reviewed a wide array of studies demonstrating that when people act on the basis of motives or preferences for which they cannot access reasons, they tend to "tell more than they know," making up sensible explanations based on their intuitive theories of themselves and of psychological causality that are entirely post facto and often incorrect. In more recent research, T. D. Wilson (e.g., T. D. Wilson & Schooler, 1991; T. D. Wilson et al., 1993) has shown that when people subsequently act on the basis of such reasons or when they try to think about why they might prefer one option over another before expressing their preference, they often make worse choices, and the original affective preference ultimately returns.

I have, no doubt, failed to cite a number of relevant studies, some conducted by New Look researchers decades ago and others by contemporary social psychologists, but I believe the point is now sufficiently clear: Freud was right in his most central hypothesis, that much of mental life, including thought, feeling, and motivation, is unconscious. Indeed, Freud and the psychoanalytic theorists who have followed in his footsteps have turned out to be right where competing psychological theories were once completely wrong and where most contemporary theories of consciousness and cognition continue to be either wrong or incomplete (e.g., about unconscious defenses).

In retrospect, the heated arguments over the last century about the proposition that much of mental life is unconscious are somewhat perplexing in light of data showing that children in Western cultures begin to recognize the nature and functions of unconscious processes, notably defensive processes, by the time they are 10 years old (Chandler, Paget, & Koch, 1978). Why this debate has been so heated and why discourse on Freud, unlike that on any other person in the history of psychology, has often been so *ad hominem* and ignorant of subsequent theoretical and empirical developments related to the approach he

initiated (e.g., Crews, 1996), are questions for historians of psychology. At this juncture, however, I believe the question of whether unconscious cognitive, affective, and motivational processes exist is no longer an interesting or informative one and that we would do better to turn our attention to the *implications* of their existence and the mechanisms by which they influence information processing and behavior.

Conflict, Ambivalence, and the Modular Mind

A second characteristic that has distinguished psychodynamic theory from other approaches to psychology since its inception is its focus on mental conflict and the correlative assumption that conscious experience and behavior reflect competition, collaboration, and conflict among quasi-independent psychological events occurring below the threshold of consciousness (Brenner, 1982; Freud, 1900/1953b). From the time Freud began observing patients, he noted the ubiquity of the conflict inherent in wanting to be free of symptoms that are clearly volitional (such as ritualized hand-washing or binge eating) but being unable to eliminate them. From these observations, Freud made a simple deduction: If the person has a conscious will to overcome a symptom (such as bulimic bingeing) but cannot do so, and the problem is not organic, some unconscious counterwill must be blocking the conscious volition (see Erdelyi, 1985). To put it another way, if a person is producing meaningful behavior involving voluntary musculature (such as bingeing) but cannot explain why and wishes he or she could do otherwise, the motive for producing the behavior not only must be stronger than the conscious will but must also be unconscious.

Ultimately, this insight about intrapsychic conflict led Freud to the postulation, similar in certain respects to contemporary connectionist or parallel distributed processing (PDP) models in cognitive science (Rumelhart, McClelland, and the PDP Research Group, 1986), that multiple psychological processes can proceed in parallel. Freud (1915/1957c, p. 170) noted that "the different latent mental processes inferred by us enjoy a high degree of mutual independence, as though they had no connection with one another" and argued against the theory that unconscious processes are really a dissociated "second" consciousness by suggesting that this would require postulation of an infinite number of consciousnesses that conflict and cooperate outside awareness.

Contemporary connectionist models view representations as distributed across a network of interconnected units of information, analogous (or perhaps homologous) to a network of neurons, which, through repeated coactivation, become activated in concert to represent a concept. This produces top-down, hypothesis-driven processing, so that, in a casino for example, a person whose concept of gambling (rather than bakeries) is activated uses this context to rule out the need to look under the feet of the nearby gambler who says he is "on a roll." Activation of some of the neural-cognitive units that represent a concept facilitates categorization of a particular instance as a member of a particular category (or, in the gambling example, facilitates simple lexical interpretation), whereas activating others (in this example, perhaps, if the gambler is at a bakery instead of a casino) inhibits this categorization. The final "decision" the brain makes when confronted with the task of categorizing a

novel stimulus (or completing any other cognitive or perceptual task) reflects an unconscious process of constraint satisfaction, in which the combination of "on" and "off" signals from thousands or millions of neurons or processing units produces an imperfect but good-enough match between current input and prior knowledge stored as patterns of firing.

Freud was as uninterested in the processes by which people categorize stimuli as contemporary cognitive psychologists are in the conflicts among wishes, fears, and values that attract the attention of psychodynamic theorists and clinicians. However, a fundamental similarity in their models is the postulation of multiple independent processing units that combine, conflict, and collaborate to produce psychological decisions, some of them conscious and others unconscious. As I suggest later, a point of integration of the two models lies in the fact that the process of constraint satisfaction described by artificial intelligence researchers leaves out a key set of constraints that are central to psychoanalysis: affective and motivational pulls from various directions, which must be satisfied alongside cognitive constraints that maximize accuracy. When fans of two basketball teams in a hotly contested championship game witness the same act of physical contact between two players and those on one side categorize it as a foul whereas the others do not—even after watching a televised slow-motion replay—it is clear that even simple perceptual tasks can be influenced by affective and motivational constraints. According to psychoanalytic theory, this is the case with most cognitive "decisions," because humans tend to have feelings about most of the people and objects with which they come in contact. Making matters more complicated, however, is the fact that their feelings and motives often run in conflicting directions.

From a psychodynamic perspective, nothing guarantees that an individual's wishes, fears, values, or goals will be in harmony, because these motives, or components of them, may be processed by relatively independent neural circuits. Thus, a person can want and fear the same thing, which leads to conflict. From a developmental perspective, conflict is virtually built into human existence. Whom do children first learn to love? And who first frustrates them and makes them enraged? For children in most cultures and families, precisely the same people are associated with security, comfort, distress, and disappointment: their primary caregivers. So conflict is built into the earliest social expectations, feelings, wishes, and fears simply by virtue of the fact that memory is built on principles of association, a crucial point of agreement and potential integration between psychodynamic and cognitive theories, to which I later return. When the child of an alcoholic parent "finds" himself or herself with an alcoholic spouse, is this accidental? Given the number of children of alcoholics who vow at some point in their adolescence that they will never pick a mate like their parent or that they will never expose their own children to the same kind of family environment they experienced, surely some counterwill must be expressing itself to override this conscious will. Such a child may well have encoded some aspects of the parent's behavior not only as something to be feared and avoided but also as part of what it means to be an appropriate love object (for relevant data, see McCord, 1988).

Or consider a more distinctly Freudian example of ambivalence. The anus is such a disgusting and smelly region that most

people will not even touch their own without the intervention of a piece of paper. So why do people often say others have "cute buns," and why is touching the buttocks or anus a relatively common aspect of people's sexual life or fantasies? Why do many men enjoy looking at women in G-strings, thong underwear, or thong bikinis that accentuate and call attention to this seemingly disgusting region of the body? Given that the vast majority of children's first 10 years of associations to the genitals and contiguous regions involve excretion, it is a wonder (and a tribute to the power of hormonal influences on thought and motivation) that anyone can ever have enjoyable sex. Ambivalence is thus virtually built into human sexuality. Clinically, this is most apparent in patients with sexual contamination issues, who are often most attracted to, and simultaneously repulsed by, the same sexual acts or body parts.

Once again, research supports this second fundamental psychodynamic supposition. That mental processes operate in parallel and that people have minimal access to the component processes that ultimately contribute to their conscious experience and behavior are now taken for granted by most cognitive scientists, although they have tended not to consider affective and motivational processes in this respect. The fact that positive and negative affect are mediated by different neural circuits (see, e.g., R. Davidson, 1992; Gray, 1990) lends credence to the view that nothing about the mind requires that any given stimulus be associated with only a single affective valence. Indeed, several literatures are independently converging on the notion that positive and negative emotional responses and interpersonal interactions are only moderately correlated, are processed separately, and have distinct correlates, including research on the impact of supportive and harsh parenting (Pettit, Bates, & Dodge, 1997), ingroup favoritism and outgroup derogation (Brewer & Brown, 1998), positivity and negativity in children's relationships (Hartup, 1996), and acceptance and negative reciprocity in marital couples (Arkowitz-Westen, 1998).

The complexity of human cognition, particularly about the significant others with whom individuals have repeated contact, virtually assures that any given representation will be associated with multiple affects. The research reviewed previously on implicit versus explicit emotional and motivational processes clearly documents not only that people may have multiple feelings about the same object but that their conscious and unconscious evaluations can be in substantial conflict, as in conflicting attitudes toward racial minorities or conflicting motives toward power. If the affect associated with a representation motivates approach or avoidance of it, if multiple affects are associated with most important objects (certainly in the social realm, which becomes readily apparent in any relationship that lasts as long as 6 weeks), and if many of these evaluative reactions are unconscious and can be unconsciously triggered—all of which are now empirically supported propositions—then the view of the mind as filled with conflict that once seemed so peculiarly psychoanalytic now seems eminently sensible. Indeed, if part of what the cognitive revolution did to prior research from a behaviorist paradigm was to show how concepts such as stimulus generalization actually imply cognitive processes of schema formation and categorization (i.e., stimuli are considered equivalent for the purposes of responding when sufficient overlap exists between the neural networks that represent them), then what

contemporary psychodynamic thinking can do is to suggest that approach-avoidance conflicts can similarly be structuralized through repeated associations, which may or may not be conscious.

A small body of research has examined conflict and ambivalence empirically (e.g., Glick & Fiske, 1996; Harter, 1986; Sincoff, 1992). In one study, students listed 15 of their personal strivings or goals, defined as objectives "that you are typically trying to accomplish" (Emmons & King, 1988, p. 1042). Participants then rated the extent to which each striving conflicted with every other striving, and the researchers used the matrix of their ratings to construct a mean index of level of conflict for each individual. Participants also reported the extent to which success at the striving would lead to some unhappiness, a second measure of ambivalence. Dependent variables included participants' daily mood reports taken twice a day over 21 consecutive days; reports of somatic complaints such as headaches, coughing, and acne; and visits to the health service. Conflict and ambivalence scores showed modest but significant correlations with reported emotions and illness.

Periodically, attitude researchers have challenged the view that attitudes can be represented by using a single bipolar evaluative dimension (negative to positive); this view is once again ascendant, as researchers have begun focusing on attitudinal ambivalence (Cacioppo, Gardner, & Berntson, 1997; Priester & Petty, 1996; Thompson, Zanna, & Griffin, 1995). Drawing on a range of social-psychological and psychophysiological studies, Cacioppo et al. (1997) have concluded that attitudes include two evaluative dimensions, positive and negative, which are relatively independent and can each be either relatively weak or relatively strong. Low-positive/low-negative attitudes are likely to have minimal impact on behavior and are quite distinct from high-positive/high-negative (ambivalent) attitudes, which nonetheless yield similar moderate scores on traditional bipolar attitude measures. In one set of studies, for example, people who were low on both positive and negative attitudes toward blood donation were significantly less willing actually to donate blood than those who were ambivalent, who were apparently able to harness their social values to overcome their (probably classically conditioned) squeamishness (Gardner & Cacioppo, 1996, as cited in Cacioppo et al., 1997).

Other investigators have examined conflict from a developmental perspective. As early as 12 months of age, infants consult their primary caregivers when confronting a novel stimulus such as a toy or person, and if they receive conflicting facial messages from their two parents (a smile from one and a fearful response from the other), they become distressed and confused (Hirshberg, 1990). Research with children whose attachment status is defined as *disorganized*, that is, whose attachment figures are highly unpredictable, shows how these children's own confusing responses (such as mixtures of approach and avoidance, often both aborted and replaced with ritualized actions) reflect internalization of the confused messages they receive about the comfort and discomfort associated with seeking nurturance (see Main, 1996; Main & Solomon, 1986). As cited previously, adults with an avoidant or dismissive attachment style manifest signs of covert emotional distress in attachment relationships alongside efforts to disavow it (Dozier & Kobak, 1992). Along different lines, a cross-sectional study asked children, adolescents,

and college students to rate the degree of support and conflict they encountered in various relationships (Furman & Buhrmester, 1992). Of particular relevance was the finding that relationships with parents were at their most supportive at the same time as they were at their most conflictual.

So how do people resolve conflicts when confronted, consciously or unconsciously, with multiple competing affective and motivational pulls? One of the most important concepts in contemporary psychodynamic theory is the notion of *compromise formation*, which attempts to address that question (Brenner, 1982; Westen, 1985, chapter 2). A compromise formation is a thought, feeling, or action that reflects a compromise among multiple motives, such as the desires to maintain self-esteem, to obtain some kind of gratification, to respond to moral imperatives, to escape unpleasant emotions, and to perceive reality accurately. The televangelists who preached the evils of illicit sex while engaging in it in one colorful variety or another in the 1980s provide useful examples. Presuming that one gives them the benefit of the doubt and does not assume that they were simply conscious hypocrites who secretly enjoyed flaunting the values they professed, one might hypothesize that their religious preoccupation with sex allowed them to focus their attention on sexual images and fantasies that their rigid sense of right and wrong precluded. At the same time, fighting this evil in other people may have helped assuage their shame and guilt for their thoughts (and, it turns out, actions). The result was a compromise that maximized feelings of both titillation and moral righteousness: They preached vociferously against sex acts that, on occasion, they had difficulty containing.

This is of course speculation, because one cannot psychoanalyze at a distance, but the public details of these cases are well known and hence provide a useful example. A simple clinical example comes from the therapy of a man who was terribly conflicted about whether to stay in a very unsatisfying marriage or to end it. He was highly prone to guilt, which kept him in the relationship for years beyond the point at which the balance of pleasure to displeasure in the marriage had shifted overwhelmingly toward the debit column. When he finally left his wife, he turned down opportunities to date two women who really attracted him and rented a small, somewhat seedy apartment that seemed to be designed both to make him uncomfortable and to dissuade any woman from "coming back to his place." When we explored his associations to these choices, the compromise he had unconsciously crafted seemed apparent: He could leave his wife, but to do penance for his guilt he could not enjoy himself, particularly with other women.

Empirical research on motivated reasoning has indirectly documented the existence of similar processes. Extraverts who are induced to believe that introversion is conducive to academic success will come to see themselves as less extraverted, but they will not completely deny their extraversion (see Kunda, 1990). That is, they will form an on-line compromise between enduring self-representations and current motives. Similarly, in a study described previously, the majority of MBA students showed self-enhancing biases when asked to rank their contribution to a group decision-making task, but most of them ranked themselves within one rank of the way their colleagues and objective observers ranked them (John & Robins, 1994). In other words, when faced with a conflict between accuracy and

self-enhancement, people compromise, creating a distorted self-portrait that allows them a balance of satisfaction of both motives. The researchers did not ask, but I doubt that participants were aware of doing this.

Similar findings emerged in a study of the accuracy of memory, in which college student participants recalled their math, science, history, English, and foreign language grades from high school (Bahrick, Hall, & Berger, 1996). When checked against their actual high school grades, students recalled 71% of their grades correctly. More interesting, however, was the pattern of their errors: Participants correctly remembered 89% of their As but only 29% of their Ds. Ds were as likely to be remembered as Bs and Cs as they were as Ds, but they were virtually never incorrectly remembered as As, which suggests a compromise between veridical information processing and desired grades. When the investigators created for each participant an index of the direction of distortions, approximately 80% inflated their remembered grades, whereas only 6% reported grades lower than they had actually achieved. The remaining 14% remembered correctly.

One might similarly consider the social-psychological literature on self-enhancement versus self-verification in terms of compromise formations. Decades of research have shown that people tend to view themselves more positively than do neutral observers, primarily because doing so protects their self-esteem. On the other hand, Swann (1990; Swann, Stein-Seroussi, & Geisler, 1992) has shown that people are motivated not only to self-enhance but to confirm their preexisting views of themselves (and presumably to see themselves accurately as well). From a psychodynamic perspective, one would predict that conscious self-representations or self-schemas reflect a balance of these often-conflicting motives. A recent series of studies has documented the way people create compromise formations that express precisely that balance (Morling & Epstein, 1997). In three studies, self-enhancement and self-verification motives led to compromise solutions in response to evaluative feedback, leading participants to prefer feedback that was only moderately self-enhancing. Participants high and low in self-esteem differed substantially in the feedback they preferred, because each preferred feedback that enhanced them but not too far above what they believed about themselves.

Continuity of Personality and the Role of Childhood Experiences

A central set of claims of psychodynamic theory from the start has been that stable personality patterns begin in childhood and that childhood experiences with caretakers play a crucial role in shaping personality (especially in shaping later ways of becoming attached to and intimate with others). For years, this claim distinguished psychodynamic from other theories. Freud argued that personality crystallizes in childhood, whereas learning theorists contended that behavior is (a) selected by its environmental consequences (Skinner, 1953), (b) shows minimal consistency over time and situations (Mischel, 1968), and (c) hence can be readily controlled and altered at any age (see Bandura, 1977). The formative role of childhood has long been a fulcrum of debate in psychology (see Kagan, 1980; Kagan & Zentner, 1996).

Continuity Over Time: A More Recent Interpretation

Research in behavior genetics (Loehlin, 1992; Plomin, DeFries, McClearn, & Rutter, 1997) has demonstrated the importance of distinguishing the two subcomponents of this third psychodynamic proposition: (a) that adult personality characteristics begin to crystallize in childhood and (b) that childhood experiences are formative for later personality and social functioning. Freud was a strong believer in temperament, even suggesting (1908/1953a) that the tendency to become fixated at one stage or another might have biological influences. However, neither he nor anyone else in the field ever imagined the kinds of heritability estimates (most in the range of .30 to .50) that twin and adoption studies have produced.

With respect to the crystallization of personality in childhood, considerable continuity between child and adult personality has been well established since Block's (1971) landmark *Lives Through Time*. More recent research has supported the proposition that, although the child is not the sole contributor to the man, he is at least the father, as intimated by poets such as Wordsworth and as developed as a psychological principle a century ago by Freud. The data are particularly strong for a link between two personality styles or types—inhibited and undercontrolled—and subsequent personality characteristics and psychopathology. For example, behavioral inhibition to the unfamiliar, which includes anxiety when faced with novelty and shyness, shows substantial continuity from infancy through early childhood (Kagan & Snidman, 1991) and from middle childhood through adulthood (Gest, 1997), with correlations across several years as high as .50. In a longitudinal study, children described as inhibited at age 3 were more likely than comparison participants to be depressed at age 21, whereas children described at age 3 as undercontrolled and impulsive were more likely to meet diagnostic criteria for antisocial personality disorder 18 years later (Caspi, Moffitt, Newman, & Silva, 1996). Another longitudinal study found that 8- to 10-year-old boys characterized as ill tempered were distinguished at age 30 by maladaptive personality traits, poor occupational performance, and disrupted marriages (Caspi, Elder, & Herbener, 1990). Ill-tempered boys were rated 20 years later as undercontrolled, irritable, moody, unethical, and undependable. A Swedish study found that children (particularly boys) rated as aggressive at ages 10 and 13 by their teachers, were disproportionately represented among criminals, especially perpetrators of violent crime, at age 26 (Stattin & Magnusson, 1989). Several other studies have shown impressive correlations between preschool variables, such as impulsivity, irritability, and passivity, and personality patterns and behavior problems in adolescence and young adulthood (Block, 1993; Caspi, Henry, McGee, Moffitt, & Silva, 1995; D. L. Newman, Caspi, Moffitt, & Silva, 1997; Tremblay, Pihl, Vitaro, & Dobkin, 1994).

Mischel (1968, 1973) was once one of the most persistent critics of psychodynamic ideas, particularly the notion of consistency of personality over time and across situations. More recently, however, he has presented compelling longitudinal evidence to the contrary and has placed his own work in the context of theorists who view the mind in terms of interacting dynamic processes, of whom he considers Freud a prime example (Mis-

chel & Shoda, 1995). In a major study (Shoda, Mischel, & Peake, 1990), he and his colleagues found that 4-year-old children who were able to delay gratification (resisting grabbing a desired object while looking directly at it) were substantially different from their peers as adolescents: They were rated by their parents as more likely to exhibit self-control when frustrated, as more likely to resist temptations, as more intelligent, and as less distractible than children who were less able to delay in preschool.

The first half of the proposition, then, that adult personality characteristics begin to be evident in childhood and that many show considerable consistency over time, has received substantial empirical support. Data from research in behavioral genetics have demonstrated, however, that a substantial part of the variance in individual differences in personality, and by extension a substantial part of the variance in documented consistency of personality over time, reflects genotypic variance (Plomin, DeFries, McClearn, & Rutter, 1997). The repeated finding that environmental effects, which typically account for at least half the variance in individual differences in personality, tend to reflect nonshared rather than shared environment among siblings, has led many to conclude that psychoanalytic ideas about the importance of childhood have finally been put to rest. In other words, if similarities between siblings who grow up in the same household are attributable to their genes and not to similar experiences at home, then surely childhood experiences and processes such as identification cannot have much of an impact on personality development.

Research in behavioral genetics is clearly revolutionizing our understanding of personality and development and rewriting every account of personality development, including Freud's. Nevertheless, several caveats are essential to understand the implications of research into the behavioral genetics of personality, many of which have been repeatedly pointed out by prominent behavior geneticists but are too easily forgotten. Three are of particular importance from the present perspective.

First, heritability coefficients are estimates of the influence of genes on *individual differences within a population*. They are *not* estimates of the relative importance of genes and environment (see Plomin et al., 1997). Height was highly heritable in 1865 just as it was in 1965—that is, genes accounted for the lion's share of differences among individuals in height in the population at each of those times—but the average soldier's uniform during the Vietnam War was almost a foot longer than the average uniform of soldiers in the U.S. Civil War because of changes in nutrition that shifted the entire population mean upward. For many physical and psychological traits, genetic factors make environmental factors relevant, and environmental factors activate genes, so that parsing the relative roles of nature and nurture is the wrong question. The only reason lengthy separations in childhood can lead to later effects on personality, social behavior, and psychopathology is that humans are genetically prepared to need other people, and the absence of appropriate caregivers at particular junctures leads to alterations in brain physiology and gene expression.

This underscores a second caveat, that heritability estimates are highly dependent on the sample. If a typical study of heritability included a substantial minority of inner-city children, heritability coefficients would likely drop considerably

because the "average expectable environment" in middle-class homes and neighborhoods is quite different from that in inner cities (for a relevant discussion, see Scarr, 1993).⁹ Decades of research on culture and personality have revealed substantial cultural differences in the way people express anger, form intimate relationships, take care of their children, pursue goals such as achievement, regulate emotion, and so forth (see LeVine, 1982). Including a random sample of individuals from dozens of cultures would lead to radical revisions in estimates of the impact of shared environment on personality (see Mandler, 1997).

Third, genetic and environmental events may influence phenotypic behavior in fundamentally different ways that may substantially bias the way heritability estimates are interpreted. Individuals whose genotype predisposes them to schizophrenia are more likely than other individuals to appear phenotypically schizophrenic or to show subsyndromal signs of thought disorder or other signs of schizotypy, such as emotional flatness or interpersonal peculiarities. Environmental events, in contrast, may not lead to such straightforward links between underlying causal and resulting phenotypic behavior. The highly variable ways in which humans can respond to the same event can lead to artificially deflated estimates of the influence of shared environment. To take a common clinical example, two siblings exposed to an alcoholic parent may respond very differently, with one becoming impulsive and alcoholic and the other constricted and workaholic. In this case, the same environmental event has led to radically different styles of impulse and affect regulation, even though both styles are clearly adaptations to the same shared environment. What makes this scenario particularly problematic in research attempting to draw aggregate conclusions about the impact of childhood experiences on adult characteristics is what happens when averaging together the characteristics of these two individuals, both of whose personalities have clearly been impacted by the same environmental pathogen: The environmental effect will average to zero if relatively equal numbers of individuals with each of these two opposite patterns are included in the sample.¹⁰

In fact, the concept of *nonshared environment* is actually a misnomer because it includes shared events to which different children respond differently. Perhaps most important, it includes gene-environment interactions that lead two children confronted with the same situation to behave differently. Thus, early separation from a parent may have a substantially greater effect on a child who is temperamentally higher in negative affect than one with an easier temperament, even though the environmental event is identical and hence shared. To put it another way, it includes the kinds of *nonshared effects of shared environments* described above, in which different children construe a situation differently, cope differently, have different emotional responses, and so forth, and hence move in divergent directions despite shared experiences.

I do not introduce these considerations to minimize the impact of genetic influences on personality development. Research is just beginning to document the hidden impact of genotypic variance on life events that are often treated as environmental stressors or assumed to be of psychosocial origins (see Jöckin, McGue, & Lykken, 1996; Kendler, 1995). The point is simply

that a comprehensive picture of the relative roles of heredity, shared environment, and nonshared environment in creating personality and maintaining personality continuity from childhood through adulthood has not yet been painted.

⁹ The dependence of heritability estimates on the sample can be seen in a study that found the lack of autonomic responsivity hypothesized to be genetically related to psychopathy to be characteristic of delinquent boys from intact homes but not boys from broken homes (Lytton, 1990). Environmental risk factors may be so substantial (or, alternatively, genetic variance so minimal) in disrupted families as to overshadow genetic effects.

¹⁰ I know of few empirical studies directly addressing this issue, but I suspect that the reason such data are not available is that the problem has not been recognized and that reanalysis of a number of data sets might shed light on it. From a methodological standpoint, one should not routinely begin with the assumption that the individuals in samples are homogeneous with respect to patterns of covariation; where samples are large enough, this assumption should first be assessed with techniques such as cluster analysis, which allows discrimination among subgroups that may differ in type rather than in degree. For example, Jennifer Harnden and I (Westen & Harnden, 1998) have recently collected a sample of patients with anorexia and bulimia and found that the two groups do not differ in central tendency with regard to a number of variables, including developmental history variables such as child sexual abuse, number of psychiatric hospitalizations, number of suicide attempts, and other measures of level of functioning. However, when we began instead by clustering participants empirically using Q-factor analysis (inverted factor analysis, in which cases rather than items are factored) and then tested for differences, we found huge group differences on nearly every variable we examined. The reason, as we discovered, is that anorexia and bulimia are not homogeneous diagnoses. The Q-factor analysis pointed instead to the existence of three groups whose membership was only partially related to symptoms: (a) a high-functioning, perfectionistic, self-critical group that includes patients with both anorexia and bulimia; (b) a low-functioning, constricted, avoidant, overcontrolled group that consists almost exclusively of patients with anorexia; and (c) another low-functioning group, consisting almost exclusively of patients with bulimia, that is undercontrolled, impulsive, and hyperemotional. Averaging high- and low-functioning patients with anorexia or bulimia led to the apparent conclusion that bulimics and anorexics are similar, just as averaging overcontrolled and undercontrolled children of alcoholics might lead to the conclusion that parental alcoholism has minimal psychological effect as an environmental variable on dimensions such as impulsivity, when in fact it can produce two different types of outcomes. Roberts and Chapman (1997) have discovered a similar phenomenon in examining self-reported well-being in a 30-year longitudinal study of women. When they simply looked at mean differences over time, well-being seemed relatively stable across three decades. When they applied more sophisticated statistical procedures to distinguish subgroups, however, they found that 30% of the sample increased by more than one standard deviation and another decreased by the same amount—leading to a net effect across the sample of zero—but that the subgroups could be distinguished based on other theoretically meaningful variables. Similarly, Harrist, Zaia, Bates, Dodge, and Pettit (1997) used cluster analysis to distinguish four types of children usually called *socially withdrawn*. Whereas one group was relatively uninterested in relationships and another was withdrawn because they were depressed, the others were interested in having friends but either anxious and hence avoidant or actively isolated by their peers. These four groups differed on a number of variables, including ways of processing social information.

The Role of Childhood Experiences

When environmental events are in fact measured rather than calculated by subtracting out genetic effects, they are much more likely to show a substantial impact on personality (see Caspi, 1998). The formative role of childhood experiences has been most clearly demonstrated in longitudinal studies and other research linking these experiences with the way adults and adolescents form and experience relationships.

One of the complexities in this research is that one cannot assume a simple model, such as "Experience x leads to trait y in childhood, which persists into adulthood," which does not capture the complexity of human development, for multiple reasons. First, childhood experiences can have delayed effects. Promiscuity is a common sequela of childhood sexual abuse that typically does not manifest until adolescence (Cavaiola & Schiff, 1988). Second, trait y may have different behavioral manifestations at different points in the life span. Aggressiveness in a child may be indexed by physical aggression toward peers, but given the low incidence of such behavior in adulthood, how does one measure the same trait in adults? Third, as individuals develop and assume an ever-widening set of roles, the ways in which they can express trait y may become much more differentiated and varied. An aggressive toddler may become an aggressive adult who displays his aggression verbally or physically, with peers or with his own children, passively or actively, etc. Fourth, many traits are better understood in the broader context of the individual's personality structure or organization. Certain parenting styles, for example, may lead to anger at age 6 but depression at age 21 as the person develops a self-critical personality style. Similarly, what may look like delayed effects of a childhood pathogen such as sexual abuse may be better understood in terms of the way organized personality patterns change and manifest behaviorally at different life stages.

Several studies from the longitudinal project conducted by Block and Block (1980) demonstrate the importance of taking a more complex view of the ways in which childhood experiences can affect adult personality. These studies have demonstrated impressive correlations among childhood characteristics, parenting styles, and later attributes, such as drug use and depression. One study found that adolescent drug use and abuse, as well as personality characteristics such as rigidity or alienation, can be predicted from mothers' interactions with their preschool children (Shedler & Block, 1990). Another study demonstrated the complexities that may be involved in predicting adult traits from their childhood antecedents (Block, Gjerde, & Block, 1991). Male participants who were *undercontrolled* and impulse-ridden in early childhood were more likely to be depressed as young adults, whereas female participants who were *overcontrolled* as children were more likely to be depressed 15 years later. These findings are more readily explained in terms of culture, socialization, and personality organization than temperament, unless one could develop a coherent genetic explanation (sex-linked genetic transmission) for the gender-specific correlation between over- and undercontrol in childhood and depression in adulthood. Studies by other research groups have documented the influence of parent-child interactions and parental socialization on subsequent personality and social behavior (e.g., Baumrind, 1967, 1991; Franz,

McClelland, & Weinberger, 1991), and research by Patterson and colleagues has shown that experimentally manipulating parental behavior through skills training can produce decreases in delinquent behavior over time (Bank, Marlowe, Reid, & Patterson, 1991).

A body of data in developmental psychopathology has documented links between experiences such as abuse, neglect, and disruptions in caretaking in childhood and later interpersonal pathology and personality disorders (see Herman, Perry, & van der Kolk, 1989; Rutter, 1986; Tizard & Hodges, 1978; Westen, Ludolph, Block, Wixom, & Wiss, 1990). Sexual abuse in childhood leaves individuals vulnerable to a number of untoward psychological experiences in adulthood such as anxiety, depression, chronic self-destructiveness, and suicidality (e.g., Boudewyn & Liem, 1995; Briere & Runtz, 1993). A longitudinal study of boys at risk for delinquency found that paternal alcoholism was a strong risk predictor of alcoholism in the son decades later (McCord, 1988). In support of models of childhood identification or modeling, the study found that a variable assessed prospectively—the extent to which the child's mother appeared to esteem the father—doubled the son's chance of being diagnosed with alcoholism 40 years later (from 35% to 70%). Maternal esteem of the father was not similarly predictive of alcoholism in at-risk boys whose fathers were not alcoholic, suggesting a clear interaction of paternal alcoholism and maternal esteem.

Nonclinical samples have similarly begun to bolster the case for an association between at least some childhood experiences and later clinical or subclinical signs of psychopathology. In a stratified random sample of over 5,000 adults, a history of parental separation or loss in childhood was associated with both lower attachment security and higher ratings of insecure attachment (Mickelson, Kessler, & Shaver, 1997). All nine childhood interpersonal traumas assessed in the study (e.g., assault, serious neglect, sexual molestation) were associated with anxious attachment in adulthood. In a study of adult female twins, a history of parental loss through separation (but not through death) was associated with later vulnerability to depression and alcoholism, even after stringent procedures to remove direct and indirect genetic effects (Kendler, Neale, Kessler, Heath, & Eaves, 1992; Kendler et al., 1996; Tennant, 1988). The data are not yet conclusive, but the association between parental loss through separation and later psychiatric problems appears likely to stem in part from the broader constellation of variables in the family environment (such as parental conflict, abuse, etc.) that precipitate family dissolution (see Kessler, Davis, & Kendler, 1997). Although some of this research is subject to potential biases of retrospective assessment, longitudinal research similarly shows that individuals who experience more negative events in childhood tend to have lower occupational success and satisfaction than their peers decades later (McClelland & Franz, 1992). Traumatic events later in life can similarly produce lasting scars, although age of trauma tends to be negatively correlated with severity of later problems (e.g., Bunce, Larsen, & Peterson, 1995).

Of particular interest are results from a recent study showing that although individuals with a history of childhood parental loss do not consciously self-report more negative mood than comparison subjects, they show less intense positive mood and

less positive feelings regarding intimacy in day-to-day life when completing a mood diary over 28 days (Bunce, Bernat, & Shevrin, 1997). They also respond differently than comparison subjects on implicit measures (facial EMG and brain-evoked potentials) when exposed subliminally to words related to intimacy and excited positive mood; interestingly, these differences do not appear with supraliminal presentation. These findings, if replicated, are important, because they suggest that the impact of some aversive childhood events may be expressed behaviorally and manifest in implicit emotional responses in adulthood but not be amenable to the typical self-report methods. These are just the kind of responses addressed in psychoanalytic forms of psychotherapy. The findings also make sense in light of the research reported by McClelland and colleagues (1989), previously described, which found substantial correlations ($r \approx .40$) between childhood experiences and implicit motives assessed by TAT decades later. In related research, Bunce and colleagues (Bunce, Snodgrass, & Larsen, 1996) found, in a nonclinical sample, that participants reporting a history of traumatic events showed greater baseline and imagery-generated sympathetic reactivity as assessed by skin conductance but less reactivity as assessed by facial EMG; this pattern suggests defensive efforts at emotional suppression, because several studies have shown this same asynchronous pattern to occur when participants attempt to inhibit affective expression or suppress thoughts. Interestingly, this pattern holds in combat veterans without posttraumatic stress disorder (PTSD) who are exposed experimentally to combat sounds but not in combat veterans with PTSD, whose efforts at affect regulation have proven ineffective and who instead tend to experience an alternation of emotional constriction and lability (Bunce, Casada, Amdur, & Liberzon, 1997).

A considerable body of research, also much of which is longitudinal, has established links between parenting styles and the subsequent tendency of adult offspring to be depressed or dysphoric. In one study (Lefkowitz & Tesiny, 1984), 19-year-old participants whose parents reported more rejecting attitudes toward them 10 years earlier showed elevated Depression scores on the Minnesota Multiphasic Personality Inventory (MMPI; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989). In another, parental coldness rated at age 5 was highly predictive of Depression scores 36 years later in midlife (Franz, Weinberger, Kremen, & Jacobs, 1996). The data from this study also supported a number of theoretical predictions about gender differences between specific childhood variables (such as maternal tolerance of the child's dependence) and adult depression. As with the work by Block, Gjerde, and Block (1991), the pattern of findings cannot be readily explained by a genetic hypothesis. Multiple regression with childhood variables as predictors accounted for approximately 40% of the variance in adult dysphoria, with the strongest predictors being lack of parental warmth and a composite index of difficult childhood experiences (such as loss, divorce, frequent moves, etc.). This latter finding is particularly impressive, although, as with most longitudinal studies, parsing out genetic influences on life events and parenting styles is difficult.

Other research shows that poor parental care in childhood leaves individuals vulnerable to depression in response to stressful events in adulthood (Harris, Brown, & Bifulco, 1986). In

research involving retrospective reports of parents by adults, a pattern of low perceived care and overprotection by parents is highly correlated with depression and predicts subsequent vulnerability to depressive episodes (Blatt & Homann, 1992; Burbach & Borduin, 1986; Gotlib, Whiffen, Wallace, & Mount, 1991; Parker, 1983). Kaplan & Gotlib (1996) demonstrated hypothesized three-way interactions between quality of perceived parenting (low care or overcontrol), quality of depression (interpersonally focused or autonomy focused), and stressful life events. For example, a person who is interpersonally sensitive and perceives her parents as low in caring is more likely to become depressed by life events that involve loss or disruption of social support. Again, these data are difficult to explain by reference to a temperamental tendency toward neuroticism, because very specific diatheses based on the meaning of particular types of events interacted with very specific stresses to produce depression.

Studies of attachment have now established the role of expectations shaped by interactions between children and their caregivers, as early as the first 12 months of life, in shaping later social adjustment (Bretherton, 1990; Lyons-Ruth, Connell, Grunebaum, & Botein, 1990; Ricks, 1985; Sroufe & Fleeson, 1986). Maternal responsiveness has proven the most robust predictor of infants' patterns of attachment (see Pederson et al., 1990), which in turn predict social adjustment and relationship patterns at least into adolescence (the current general age of the first participants being followed in longitudinal attachment research since infancy). Other research has shown that parents' attachment patterns vis-à-vis their own parents are highly predictive of their unborn infants' later patterns of attachment to them, documenting the impact of parental attachment style on the child's developing experience of relationships (Fonagy, Steele, & Steele, 1991; H. Steele, Steele, & Fonagy, 1996). The almost uniformly higher predictive power of maternal over paternal attachment style in these studies (see, e.g., Main et al., 1985) again militates against a primarily genetic explanation.

None of this is to suggest that childhood experiences inevitably leave indelible marks that later experiences cannot correct or obviate. Many longitudinal studies have shown only modest associations between early childhood experiences and temperament on the one hand and adult personality and psychopathology on the other (see Kagan & Zentner, 1996). Not all children who are securely or insecurely attached at 12 months will show similar patterns of attachment at 6 years (Lamb, 1987), and the study of resilient children certainly makes clear that the determinism assumed by many psychoanalysts through the 1940s was too extreme (see Masten, Best, & Garmezy, 1990). Today, psychologists are more likely to recognize the transactional nature of development and the interaction of thought, feeling, and behavior patterns established in childhood with subsequent experiences that may reinforce them. Thus, a child whose primary caretaker finds holding, touching, and tenderness uncomfortable is likely to discover early that such experiences are sources of as much anxiety as comfort and is likely to try to shut off needs for them (Main et al., 1985; Sullivan, 1953). In so doing, the child learns to behave and process information in a way that may distance others, who in turn respond with behavior that confirms the expectation. Interrupting a cycle of

this sort would likely require substantially changed life circumstances.

Psychoanalytic theory since Freud has undoubtedly underestimated the importance of postchildhood events in shaping personality as well. Adult traumas such as rape and torture can permanently affect a range of cognitive, affective, and behavioral processes, as can events that are less obviously catastrophic but nevertheless tremendously powerful (such as divorce or enduring occupational derailments) depending on their meaning to the person. More generally, with the exception of Erikson (1963) and some of the neo-Freudians, psychoanalytic theorists have tended to underestimate the importance of schemas about situations that arise only after early childhood, such as repeated frustrations and feelings of inadequacy in learning-disabled school-age children or repeated romantic rejections in the teenage years, which can have a wide impact on the self-concept, expectancies regarding the self and others, and so forth.

Nevertheless, what psychoanalytic theory has stressed from the start, and what seems both theoretically sensible and empirically supported, is that most important human experiences—namely, those involving feelings of intimacy and adequacy—have precursors in childhood that leave their precipitates not only in working models of the self, others, and the world but also in motives, emotions, and ways of regulating emotions in later situations that activate these prototypes. To the extent that these processes reflect repeated experiences or experiences that are painful and conflictual and hence have engendered automatized affect-regulatory procedures to cope with them, they are more likely to be resistant to change and to require more extraordinary experiences to alter them.

The Role of Mental Representations of the Self, Others, and Relationships

That mental representations of the self, others, and relationships play a crucial role in the way people establish intimate relationships and in the forms of psychopathology they suffer from was once, like the emphasis on childhood experience, a peculiarly psychoanalytic supposition. Freud (1914/1957b, 1917/1957a) first began developing hypotheses along these lines about 80 years ago, as he examined the representations of people suffering from mania and melancholic depression. From these beginnings emerged object relations theories in the 1930s and 1940s, which focused on representations of the self, others, and relationships (called, unfelicitously, *object representations* for reasons not worth describing here) and on the interpersonal behavior believed to reflect the interaction between these mental representations and people's wishes, fears, and emotions (see Greenberg & Mitchell, 1983; Westen, 1991). Today, most psychodynamic theorists and therapists rely heavily on object relations theories (or, to use the more human-sounding term, relational theories; Aron, 1996; Mitchell, 1988).¹¹

Object relations theories have led to the most productive area of psychodynamically inspired research, in part because of their accessibility to measurement from self-reports, projective tests, and interview methods (see Blatt & Lerner, 1991; Levy, Blatt, & Shaver, 1998; Stricker & Healey, 1990; Westen, 1991). For example, one study assessed children's representations of their relationships with their mothers by asking 4- and 5-year-olds to

complete story stems of emotionally charged situations (Oppenheim, Emde, & Warren, 1997). Themes of positive interaction and nonabusive discipline were negatively correlated with maternal reports of the child's internalizing behavior (depression and distress), whereas presence of negative themes (such as physical or verbal abuse) strongly predicted maternal reports of externalizing behavior (aggression and misbehavior). The same relations held between thematic content and mothers' reports of their own distress, which suggests that children's representations, assessed projectively, bore some relation to actual parental behavior or feeling states. A study just completed in my laboratory (Calabrese, 1998) found that measures of dimensions of object relations (such as the capacity to invest emotionally in relationships) coded from the narratives of adults predicted both their own relationship status and that of their parents (i.e., whether their parents' marriage was still intact), whereas self-report measures of attachment, self-esteem, and fear of intimacy predicted only other self-report measures.

Again, one of the major sources of data pertaining to this fourth basic psychodynamic tenet is attachment research, which is not surprising, because Bowlby (1969) was himself an object relations theorist. Mary Main (1990) and her colleagues provided a key tool for assessing representational processes by developing the Adult Attachment Interview (AAI; Main et al., 1985). A large body of literature now documents that adult attachment styles as assessed by the AAI and other measures (Brennan, Clark, & Shaver, 1998) are highly predictive of variables such as the way people respond interpersonally to threatening events (either by seeking comfort or by withdrawing; Simpson, Rholes, & Nelligan, 1992), the extent to which they acknowledge distress (Dozier & Kobak, 1992), and their styles of coping (Mikulincer & Florian, in press; Mikulincer, Florian, & Weller, 1993). Research on the intergenerational transmission of attachment documents that the internal working models or representations of relationships assessed in adults are highly predictive of similar models assessed from the behavior of their infants and young children (Main et al., 1985; van IJzendoorn, 1995).

By the 1970s, similar constructs were being developed by researchers and clinical theorists of very different theoretical orientations. Mischel (1973, 1979) and later Cantor and Kihlstrom (1987) assimilated notions such as Kelly's (1955) personal constructs (views of people idiosyncratic to individuals that guide the way they think about themselves and others) to cognitive-social approaches to personality, eventually integrating them with information-processing theory and research. Higgins (1990) has shown that people interpret social information on the basis of chronically accessible as well as recently activated constructs and that their emotions reflect discrepancies

¹¹ In the survey of psychodynamic clinicians described above, participants were asked to rank the extent to which they subscribe to the following five theoretical perspectives: classical psychoanalytic, object relations, self psychology, neo-Freudian, and "other." Of the 86 respondents, 48.1% ranked object relations theory first and 38.0% ranked it second, for a total of 86.1%. In contrast, the perspective that received the next highest rankings was classical psychoanalysis, which 22.8% endorsed as their preferred perspective and 21.5% ranked second (for a total of 44.3%).

between various types of self-representations or self-schemas. Strauman and his colleagues (Strauman, 1992; Strauman, Lemieux, & Coe, 1993) have demonstrated that such discrepancies not only distinguish different kinds of patients (anxious vs. depressed) but even predict immune response when confronted with different kinds of self-relevant information.

The psychoanalytic concept of transference is predicated on the view that people's wishes, fears, feelings, and perceptions of significant others will resemble *prototypes* from the past (a term Freud himself used) to the extent that aspects of the person or situation activate those mental prototypes (see Singer, 1985; Wachtel, 1981; Westen, 1988). Andersen and Cole (1990) documented the cognitive side of transference experimentally by asking participants to describe significant others and then embedding descriptions from their responses in descriptions of fictional characters. When subsequently asked to describe the characters, participants mistakenly attributed traits to the characters that were part of their schemas of the significant other but were not originally included in the character's description. More recently, Andersen and her colleagues have extended this ingenious experimental paradigm to demonstrate the transference of affect from significant others to descriptions of unknown others allegedly seated next door (Andersen & Baum, 1994). In their latest work, Andersen, Reznik, and Manzella (1996) showed that these affective evaluations lead to differential tendencies to avoid or approach the person next door, demonstrating that transference processes can influence cognition, affect, and motivation—a central claim of psychoanalytic theory since Freud. In a crucial demonstration, they have now also shown that the effects they have produced in this program of research can be obtained unconsciously through subliminal presentation of significant-other descriptors (Glassman & Andersen, 1997). Other researchers, notably Luborsky and colleagues, have examined transference processes empirically from narrative data, particularly psychotherapy transcripts (Luborsky & Crits-Christoph, 1990).

Researchers are currently examining the impact of disturbances in social cognition and object relations on the understanding and treatment of various forms of psychopathology (Blatt, 1994; Higgins, 1990; Mineka & Sutton, 1992; Strauman, 1992; Westen, 1991). Research on depression provides a good example in that distinctions between representational triggers were first explored by psychodynamic researchers (Blatt & Zurhoff, 1992; Mongrain, Vettese, Shuster, & Kendal, 1998) and are now being actively explored by cognitively oriented researchers. Investigations of clinically depressed patients have found that roughly half of these patients have concomitant personality disorders (Shea, Glass, Pilkonis, Watkins, & Docherty, 1987; Zimmerman, Pfohl, Coryell, Stangl, & Corenthal, 1988). Given that the diagnostic criteria for all the *DSM-IV* (*Diagnostic and Statistical Manual of Mental Disorders* [4th ed.]; American Psychiatric Association, 1994) personality disorders are heavily interpersonal, this suggests that many depressed patients have substantial object-relational pathology. An important question is whether depressed patients with pathological object relations differ in some important ways from their depressed peers.

The data suggest that they do. For example, two initial studies compared borderline patients, with and without concomitant depression, to other depressed patients using Blatt, D'Affliti,

and Quinlan's (1976) Depressive Experiences Questionnaire (Westen et al., 1992; Wixom, Ludolph, & Westen, 1993). Both studies found that the quality or phenomenology of depression differs substantially depending on whether or not participants have borderline pathology. Borderline participants manifested a type of depression characterized by feelings of emptiness, loneliness, desperation vis-à-vis attachment figures, and labile and diffuse negative affectivity. Subsequent studies have replicated these findings (e.g., Rogers, Widiger, & Krupp, 1995). One study examined the relationship between intensity of depression (as assessed by both interview and self-report) and the extent to which participants endorsed items on a borderline depression factor that tapped this particular quality of depression (Westen et al., 1992). For borderline patients, the correlation was .70; within the limits of reliability of measurement, this suggests that depression in borderline patients is essentially the same thing as loneliness, emptiness, etc. For nonborderline major depressives, however, the correlation was $-.50$: The more they endorsed borderline depression items, the less depressed they were. Research that does not distinguish between these two different types of depression may thus be mixing groups that are psychologically highly dissimilar. Indeed, Peselow, Robins, Sanfilippo, Block, and Fieve (1992) documented differential response to tricyclic antidepressant medication depending on whether depressed patients' depression centered on interpersonal concerns such as loss or on concerns about failure and threats to autonomy.¹²

One might wonder whether object-relational variables may be mediating or moderating a number of relations between depression and other variables, such as the association between maternal depression and childhood psychopathology. Studies of risk factors for psychopathology, such as those examining the relation between maternal depression and psychopathology (see, e.g., Rutter, 1986), have seldom explored precise mechanisms through which parental psychopathology leads to pathology in the child. Given that at least half of the population of patients

¹² Although no one has yet explored the relation between object-relational variables and the dimensions of the five-factor model of personality (McCrae & Costa, 1990), notably neuroticism, the data from these studies cast doubt on the rival hypothesis that these findings are all reducible to level of neuroticism. In the studies reported above as well as in several others (for a review, see Westen, 1991), substantial differences emerged on dozens of variables between two groups high on neuroticism: patients with major depressive disorder and with borderline personality disorder (BPD). The data showed that a lonely, rejection-sensitive depression (along with expectations of interpersonal malevolence, peculiarities in making attributions about interpersonal events, need for self-soothing through polysubstance abuse, etc.) distinguished patients with BPD from depressed patients without borderline pathology. Note that these differences are probably not readily understood by use of the five-factor model (FFM) even at the level of facets (subfactors) because the FFM includes no process variables, such as fears of abandonment or ways of coping, that tap many of the differences between major depressives with and without BPD. In recent research from our laboratory, we have found that factor analysis of sophisticated personality data from expert observers does not yield a simple Neuroticism factor in a large personality-disordered sample ($N = 530$), because there are simply too many ways to be neurotic (Westen & Shedler, 1998, in press).

with major depression is comorbid for personality disorders, the possibility cannot be ruled out that part of the link between maternal depression and psychopathology in offspring is really a result of long-standing maternal disturbances of object relations—that is, of personality, not of episodic mood state. The differences in parenting may well be profound between a caregiver without a personality disorder who becomes periodically depressed and the parenting of a caregiver whose depression occurs in the context of grossly unstable relationships and a tendency to see the child in contradictory or malevolent ways.

Similarly, my colleagues and I are currently examining whether the well-documented association between social support and health (e.g., House, Landis, & Umberson, 1988; Martikainen & Valkonen, 1996) may reflect in part a link between object relations and health. Social support is generally operationalized as the number of people participants have in their social networks, the number of people they feel close to and confide in, the extent to which they perceive others as helpful, supportive, empathic, etc., or some combination of these (see Pierce, Lakey, Sarason, & Sarason, 1997). Less empirical attention, however, has been paid to the variables that explain why a person has or does not have close relationships or why the person experiences others as supportive or nonsupportive. From a psychodynamic perspective, object-relational processes, such as the nature of a person's mental representations of the self, others, and relationships, should play a substantial role in accounting for the capacity to form and maintain supportive social relationships. A preliminary study from the author's research group found self-reported object relations to be a better predictor of self-reported health and visits to the doctor over the prior 12-month period than were measures of social support (Costanzo, 1996).

A recent study by Russek and Schwartz (1997) may shed some light on the links between representations and health as well as on the role of representations formed in childhood on subsequent health status. Using a longitudinal design, the investigators found that ratings of perceived parental caring made by participants in college were highly predictive of their health status in midlife. Participants who perceived their parents as less caring in college were significantly more likely to suffer at midlife with illnesses such as coronary artery disease, hypertension, duodenal ulcer, and alcoholism, even holding constant family history of illness and adult risk factors such as smoking.

Developmental Trajectories

A final central proposition of contemporary psychodynamic theory is that personality development entails not only learning to manage sexual and aggressive impulses but moving from an immature, dependent state to a mature, interdependent one. Freud focused on the development of his two drives, sex and aggression. Thus, he emphasized both psychosexual development and the ways children gradually learn to handle their aggressive impulses. Since Freud's time, psychoanalytic theorists have shifted from a primary focus on the development of sexuality to a focus on the evolving capacity for forming and maintaining intimate relationships.

Freud's Psychosexual Theory

From the start, Freud focused most on psychosexual development, arguing that personality development reflects the child's quest for gratification and the process of learning to deal with impediments to it, many of them socially imposed. Freud and his followers no doubt overemphasized the role of sexuality in personality and offered some wild speculations that have contributed to the low regard in which many in academic psychology hold psychoanalysis. Nevertheless, several of Freud's psychosexual hypotheses actually make considerable developmental sense when understood from the point of view of the child. Consider, for example, the experience of the child undergoing toilet training. What does a toddler experience when her parents are suddenly demanding something from her, namely that she control her own body and excrete some of its contents when and where they see fit? How could she not wrestle with the issues of dirtiness and cleanliness and of compliance and defiance that Freud attributed to children at this age? "Why," she might ask, if only she had the language, "don't you poop when I tell *you* to poop?" She is learning an important lesson during this period—on the potty and off—about who is the boss. As previously cited research on transference processes suggests, the way she copes with it will influence (though certainly not completely determine) the way she subsequently processes information about and copes with similar circumstances in the future.

Although the most compelling data regarding Freud's psychosexual theory do not come from the laboratory, decades of research (reviewed in Fisher & Greenberg, 1985, 1996; Kline, 1981) have attempted to test specific hypotheses derived from it. The data are mixed on many hypotheses; some, however, have received substantial support. For example, several researchers have produced evidence for the construct validity of an oral character style, characterized by features that could only be predicted by Freudian theory. Such features include the combination of an orientation toward seeking nurturance and contact with others (measured by self-report, by projective responses, and by behavior, such as help seeking, volunteering, and touching, in experimental settings) and indexes of orality in the literal sense, such as a tendency to produce oral responses on the Rorschach (see Bornstein & Masling, 1985; Fisher & Greenberg, 1996; Juni, Masling, & Brannon, 1979; Masling, 1986; Masling, Price, Goldband, & Katkin, 1981). Factor analytic questionnaire studies have similarly supported the concept of an anal character style, characterized by traits such as orderliness, stinginess, stubbornness, rigidity, concerns around control, and issues surrounding spending versus retaining money (Fisher & Greenberg, 1996; Kline, 1981; Torgersen, 1980). A study using a multimethod assessment of anality (including such measures as questionnaires, a word-stem completion task, and frequency of references to dirt in spontaneous thought) found correlations between enjoyment of anal humor (as opposed to oral or other sexual humor) and measures of anality (O'Neill, Greenberg, & Fisher, 1992). This finding is particularly important because a link between a personality style and enjoyment of anal humor is neither intuitive nor predicted by other

theories. Evidence linking these character styles to particular developmental phases, however, is much more tenuous.

Studies of the Oedipus complex have also produced some striking findings (again, for a review, see Fisher & Greenberg, 1985, 1996). For example, Friedman (1952) scored the extent to which children produced positive or negative endings when completing two stories: (a) one in which they were engaging in a pleasurable activity alone with their same-sex parent and were then met by the other parent and (b) one in which they were engaging in a pleasurable activity with their opposite-sex parent and were then interrupted. As predicted, the children produced more negative endings to oedipal stories in which they were initially alone with their opposite-sex parent. Interestingly, similar findings emerged with a second projective measure but not with measures assessing conscious feelings—consistent with the previously described data on implicit versus explicit cognitive, affective, and motivational processes.

More recently, Watson and Getz (1990) asked parents of children ages 3–6 to record over a 7-day period the number of affectionate and aggressive acts they displayed toward their same- and opposite-sex parents. Supportive of Freud's theory, affection toward the opposite-sex parent and aggression toward the same-sex parent were significantly more common than the reverse. This oedipal pattern was strongest at age 4 and began to decline by age 5. These findings are particularly important because they are neither intuitively obvious nor predictable from other theories; in fact, on the basis of socialization, social learning, and reinforcement history, one might expect more aggression toward fathers from children of both sexes. Other research has found that subliminal presentation of the stimulus *Beating Dad is OK* produced increases in dart-throwing performance among male participants, whereas *Beating Dad is Wrong* produced decreases; similar stimuli (such as *Beating Mom is Wrong* or *Beating Him is Wrong*) did not have the same effect (see Palumbo & Gillman, 1984).

More broadly, data from the Sears, Maccoby, and Levin (1957) longitudinal data set have documented the influence of socialization for sex and aggression on later personality (J. Weinberger & McClelland, 1990), as have numerous cross-cultural studies (see Whiting & Child, 1953). Longitudinal studies conducted by both Block (1971) and Vaillant (1977) have demonstrated correlations between parenting styles in early life and later sexual comfort or inhibition in adulthood.

Although these examples are impressive, most psychosexual hypotheses are obviously difficult to test in the laboratory, and many are, no doubt, too sweeping or simply wrong. One should not, however, ignore the myriad instances in which Freudian theory can provide a compelling explanation, especially where other theories can offer no rival explanations. For example, I recently received an anxious call from a man whose 3-year-old son had suddenly, despite their previously close and loving relationship, become very rejecting. The last straw was when the little Oedipus told him, "Mommy says she doesn't want you to be my daddy anymore. So you have to go away." When I told this to a colleague, he said he could top that story: His 4-year-old son had recently said, "Mommy, daddy has to leave. I don't like him anymore." When the

child's mother asked why, the boy baldly acknowledged, "He has a bigger penis than I do." I would be very interested in an interpretation of these data from the perspective of the five-factor model. Or consider an occasion I witnessed myself, when two young boys in the dressing room of a clothing store were distraught because every time they pulled the curtain closed in one direction, it opened in the other. "You have to close it," one of them admonished, "so no one can come in and steal your 'ding.'" Presumably the boy had not received instruction from his parents to protect his ding in J.C. Penney's.¹³

An Expanded Concept of Development

Erikson (1963) broadened Freud's model of development by drawing out an implication that was sometimes explicit and sometimes implicit: Freud's theory of psychosexual development was to be understood not only literally as a progression of sensual pleasures arising from different bodily zones but also more metaphorically as the evolution of the child's experience of the self and the social world. Thus, the oral stage is not only a time in which children will stick anything in their mouths but a period of profound dependence, wherein they learn what it means to rely on others. The anal stage is not only a period in which children learn about a particular orifice but an era in which they begin to develop attitudes toward control, cleanliness, and the demands of authority. Investigations of Eriksonian concepts of identity (Marcia, 1994), intimacy (Orlofsky, 1993), and generativity (Bradley, 1997; McAdams, 1992) have been some of the most methodologically sound studies inspired by psychoanalytic theories of development.

Contemporary psychodynamic theorists do not discount the importance of psychosexual development as Freud conceived it or of the impact of socialization for sex and aggression on personality. Like Erikson, however, they tend to focus more on the development of the capacity for intimacy and relatedness to others. Nearly a half century ago, Fairbairn (1952) took issue with Freud's notion that people seek others for their orifices, proposing instead that people need people. He thus posited that development entails a movement from an immature, dependent state in infancy to a mature, interdependent state in adulthood. His conception of development foreshadowed many contempo-

¹³ Personally, I did not find any of Freud's psychosexual notions compelling until I began doing clinical work and found myself confronting phenomena that simply could not be easily explained by alternative theories. Some patients, who were highly competitive with members of the same sex, reported the combination of a highly flirtatious relationship with their opposite-sex parent and the devalued view of their same-sex parent that Freud described. Others (a) repeatedly chose inappropriate partners who resembled their parents in some critical way, (b) were only attracted to much older lovers, (c) could readily pinpoint key sexual fantasies in childhood, or (d) recalled distinctly Freudian childhood thoughts and feelings about their genitals that persisted into adulthood and continued to influence their sexuality (such as feeling deeply ashamed about the relative size of their penis or feeling that their vagina was damaged, deformed, or disgusting). These were not simply instances of schema-driven assimilation, because I was actually quite resistant to several of these notions and initially found these observations more discrepant than confirming.

rary feminist views of relational development (e.g., Miller, 1994).

Object relations theorists have offered a variety of developmental stage theories. Although they have tended to be ignorant of debates in psychology about the stagelike or continuous nature of development and of empirical literatures that bear on their theories (see Westen, 1989, 1990c), in general these theorists have argued that with development children become increasingly capable (a) of seeing others in more complex, less egocentric ways, (b) of investing emotionally in others for who they are and not primarily for the gratifications they can provide, and (c) of putting their moral values at times above their immediate needs and wishes. Once again, research from a number of domains, such as the development of person perception (Livesley & Bromley, 1973), perspective taking (Selman, 1980), conceptions of friendship (Damon, 1977), the self-concept (Damon & Hart, 1988; Harter, 1998), moral reasoning (Kohlberg & Kramer, 1969; Rest, 1983; Turiel, 1998), and ego development (Loevinger, 1976), supports this view. So too does research specifically designed to examine development from 1st through 12th grades on various dimensions of object relations, as assessed from interview and TAT responses (Westen et al., 1991). This research has documented a progressive ability to represent the self and others in complex and integrated ways and a capacity for caring about others' needs (rather than just using others for pleasure or self-soothing) that grows throughout childhood and adolescence (and probably beyond). As we have seen, other research has shown what happens to later patterns of intimacy when childhood experiences such as sexual abuse, nonnurturant parenting, or extended parental separations disrupt normal developmental processes.

Implications of a Revised Understanding of Psychodynamics for Psychological Science

The five propositions examined here were all originally associated exclusively with psychoanalysis and were hotly contested. The empirical data described above challenge the commonly held view, voiced clearly by Crews (1996) in the quotation that began this article, that psychodynamic theory has no empirical basis and belongs, along with other Mesozoic curiosities, in a museum of natural history. Much of the research cited here was not conducted by researchers with any interest in psychodynamics, but taken together, these studies from diverse literatures suggest the need for substantial modification of current views of the approach initiated by Sigmund Freud.

So are we all Freudians now? Or could one equally contend that psychology has independently come around to some of the basic propositions of contemporary psychodynamic theory and has done so in an empirically sound way so that contemporary psychodynamic thought remains superfluous? In this final section, I hope to show the fallacy of the latter sentiment, arguing that as psychologists we can no longer afford to mistake Oedipus Rex for Tyrannosaurus Rex.¹⁴ Constraints of space (and intellect) prevent me from a thorough description of the ways in which a reconsideration of psychodynamic theory could enrich multiple areas of psychological research and practice. I briefly explore three examples: implications for (a) social psychology,

(b) cognitive science, and (c) our understanding of what constitutes data in empirical psychology.

Psychodynamics and Social Psychology

Many areas of social psychology might benefit substantially from an integration of psychodynamic concepts into mainstream psychology, such as research on social cognition and attitudes. In describing attitudes or schemas in social information processing, researchers might do well to specify several of their qualities emphasized by psychodynamic clinicians in clinical work, such as the multiple affective associations linked to various aspects of them, the strength of these affective associations, and the denseness of connections among aspects of the representation with differing affective valence.

Incongruence of Implicit and Explicit Processes

For example, one of the most striking anomalies in the literature on couples and marital interactions is that the mean level of marital satisfaction reported by men and women on a self-report measure such as the Kansas Marital Satisfaction Scale (Schumm, Paff-Bergen, Hatch, & Obiorah, 1986) is roughly 18 points out of a possible 21. Yet the divorce rate in the United States is over 50%. So what does this mean about the on-line construction of conscious, explicit beliefs about one's marriage? Presumably over the course of millions of interactions, spouses are going to associate aspects of each other with the entire gamut of feelings; however, when a researcher asks spouses about their partner, about their marriage, or about marriage in general, somehow a selection process is activated that allows most people to ignore most or all of the negative instances or associative links—that is, unless the marriage is ending or over, in which case the explicit attitude or schema shifts in affective valence.

The study of social cognition has relied heavily on hypothetical people as targets, so that such basic processes as affective representational shifts, and the mechanisms that underlie them, have not been studied. Yet in reality, the norm in human life is that people have conflicting feelings toward most people about whom they process information, and we know little about the way in which conflicting social information, and particularly information associated with contradictory affect states, is processed. Recent research on attitudinal ambivalence is an exciting development in this regard (e.g., Priester & Petty, 1996). Many

¹⁴ I do not explore here the clinical implications of taking empirically validated psychodynamic propositions seriously—other than to suggest that advocates of alternative treatment strategies need to reconsider some of their fundamental assumptions in light of these new data, particularly on unconscious processes (Westen & Arkowitz-Westen, in press). If patients can act on the basis of unconscious networks of association, motives, and defenses, then any approach to treatment that fails to address such ubiquitous processes is likely to need substantial supplementation. Indeed, if behavior can reflect unconscious structures of meaning, learning to interpret these structures must be a central aspect of clinical training. Psychoanalysts will equally need to reconsider lingering archaic views of "the unconscious" as a primitive, instinctual cauldron of untamed motives, in light of research on the manifold varieties of unconscious processes, many of which are quite adaptive (see Bargh & Barn-dollar, 1996; Epstein, 1994; Westen, in press-b).

studies, however, have used fictional targets about whom participants know little and have no emotional investment or have assessed attitudinal ambivalence consciously by self-report. Future studies should consider the potential role of implicit affective responses associated with an attitudinal object. Furthermore, clinical experience and research suggest that individuals differ tremendously in the extent to which they can integrate affectively mixed qualities into their explicit schemas of the self and others (Baker, Silk, Westen, Nigg, & Lohr, 1992). Integrating social-cognitive and psychodynamic explanations might offer a rich way of thinking about the conditions and individual-difference variables that foster the capacity to construct multivalent explicit schemas of the self and others.

The word *consciousness* almost never appears in discussions of schemas, yet diametrically opposed explicit and implicit representations of the self or others can be active at any given time, leading to behavior that betrays conflicting feelings (see Westen, 1991). We should never speak of representations, expectancies, or attributions without specifying their level of consciousness. Gilbert (1991), for example, has shown that the automatic attributions people make under heavy cognitive load are quite different from the consciously corrected attributions they make when given the chance. Recent research predicting drug and alcohol use from explicit outcome expectancies and from implicit associations between drugs and their affective consequences has found implicit expectancies more predictive (Stacy, 1997). Research on defensive pessimism (Cantor & Harlow, 1994; Spencer & Norem, 1996) shows that conscious, self-reported expectancies (e.g., "I'm going to fail") may be quite discrepant from the unconscious expectancies that can be inferred from the fact that such individuals persist and succeed. The implications of potentially conflicting conscious and unconscious attitudes would be a ripe area for research on cognitive dissonance as well. For example, does dissonance reduction banish discordant information or simply render it unconscious? If the latter is the case, can feelings inconsistent with self-reported attitudes nevertheless find implicit behavioral expression? And does inhibition of dissonant cognitions lead to their chronic activation, as in Wegner's (1992) research on thought suppression?

Indeed, we would do well to avoid words like *activation* and *accessibility* without specifying whether we are referring to conscious or unconscious activation or accessibility. The most well-intentioned of conscious liberals may decry racial stereotypes and deny his acceptance of them despite their repeated implicit expression when he is choosing a seat on the subway. As suggested by some dynamically informed approaches to stereotyping (e.g., Katz, 1981), he may even hold or construct "on-line" conscious beliefs that are particularly liberal precisely because he is defending against a negative stereotype that is part of his unconscious associational networks but conflicts with his conscious values (e.g., consciously believing that, even if O. J. Simpson was guilty, his acquittal is justified because of the history of oppression of other Black men, while unconsciously sharing a cultural representation of the dangerous Black man). In this case, which schema is active? The schema of the oppressed Black man or the schema of the violent, dangerous Black man whom one avoids sitting next to on the subway? Which schema is chronically accessible?

Or consider the recent extraordinary series of experiments

by C. Steele (1997; C. Steele & Aronson, 1995) in which a manipulation as simple as asking African American students to fill in their race before taking an exam described as difficult primed negative stereotypes about Blacks and achievement (and hence about themselves) and led to substantial decrements in performance. In cases such as this, the cognitive and affective aspects of a schema that chronically reach consciousness may be very different from those that do not. An African American student may express unambivalent racial pride and consciously disavow any of the negative beliefs about her race that are pervasive in her culture. Yet the same student may show the effects of these beliefs in her test-taking behavior. What, then, are this student's "real" attitude and "real" self-schema?¹⁵

Three Axes of Activation

These arguments converge with neurological data to suggest that we should distinguish three orthogonal axes involved in "activation" that influence thought and memory. The first is the distinction between conscious and unconscious activation, which maps loosely onto anterior (prefrontal) versus posterior cortical activity. When people perceive or represent information in their minds without activation of working memory, posterior regions of the brain in the occipital, temporal, and parietal cortex are activated, depending on the nature of the representation. When they bring that information into consciousness or hold it in mind briefly in the absence of the stimulus, areas of the dorsolateral prefrontal cortex, among others, are activated (see, e.g., Frith & Dolan, 1996). As argued below, representations selected for consciousness are not necessarily those with the highest level of unconscious cognitive activation.

A second axis of activation is *excitation versus inhibition*. Most contemporary models of associative memory assume that when activation spreads from one representation to another, it can either facilitate or inhibit it. Thus, when one first tries to classify a cat as Siamese or Burmese, both representations are likely to be active below the threshold of consciousness. As soon as one of these representations "wins out," the other is inhibited. Multiple areas of cognitive research support this distinction, such as experiments on directed forgetting (Bjork, Bjork, & Anderson, 1998). Instructing people to forget the first part of a word list reduces recall and proactive interference with the next part of the list, demonstrating that this procedure does in fact inhibit retrieval. However, both implicit memory and recognition memory for the to-be-forgotten words are unimpaired, which suggests that the representations remain active. In many respects, this is a nonaffective analog of a psychodynamic

¹⁵ C. Steele (1997) argued that these results reflect knowledge of stereotypes but not internalization of them and cited consistent findings over decades that show that Black and White students do not differ in self-reported self-esteem. However, in his own study he measured what is essentially implicit self-esteem by telling participants that the test was diagnostic of their ability (and hence stereotype relevant) and then giving them a word-stem completion task with stems like *lo--* and *du--*. Black students were more likely to complete the word stems with words reflecting low implicit self-esteem (such as *loser* and *dumb*). They were also more likely to complete word stems lending themselves to negative racial stereotypes with those words (such as *lazy* from *la--*).

process of motivated inhibition of memory, in which efforts at conscious inhibition do not similarly eliminate unconscious or implicit activation; the major difference lies in the motivation for inhibition.

A third axis of activation is *cognitive versus affect-regulatory*. Affect can influence excitation in at least two ways. First, with some important qualifications (see Reisberg & Heuer, 1995), humans and other mammals tend to have better memory for emotionally significant events. From an evolutionary standpoint, memory for emotionally significant events should be stronger because these events are more likely to carry adaptive significance. In this sense, affect is simply one more source of excitatory cognitive activation; that is, it increases excitatory activation of implicit or explicit representations.

Affect, however, serves a second and distinct activational role: It activates approach or avoidance toward stimuli as well as inhibition or facilitation of conscious activation of thoughts, feelings, or impulses, independently of its impact on level of activation in the more strictly cognitive sense. The importance of the distinction becomes clear when one considers phenomena that involve negative affect such as punishment and avoidance learning. From a behaviorist perspective, repeated trials in which an animal receives an electric shock each time it presses a bar previously associated with reward will *weaken* the response tendency, inhibiting a previously reinforced response. From a cognitive perspective, however, the mechanism for this inhibition is that repeated trials *strengthen* the cognitive connection between the bar, shock, and fear. Aversive stimuli such as electric shocks are *motivationally inhibitory*, leading to inhibition of behavior, but *cognitively excitatory*, reinforcing a neural connection and heightening activation of learned associations (see Westen, 1985, chapter 2). To put it another way, feelings (such as pain or fear) not only provide *information* but trigger affect-regulation strategies, which may produce behavioral and cognitive effects directly opposite to the effect of the same emotion on cognitive activation. (Relevant research on avoidance learning in rats has shown that the effects of amphetamines on memory enhancement and reinforcement are neurally independent; see White, 1995.)

For example, people are motivated to avoid memories of painful events, but these are nonetheless more vividly remembered. In this case, negative affect produces countervailing cognitive effects (excitatory activation) and affect-regulatory effects (activation of inhibitory mechanisms). This may help explain the oscillation between memory intrusion and memory failure for traumatic memories in individuals with PTSD (see Horowitz, 1987). Freud used the concept of repetition compulsion (a motivational explanation) to try to explain intrusive memories, and many cognitive theorists have proposed cognitive explanations. An alternative account combines motivational and cognitive explanations: Unresolved traumatic memories remain cognitively activated precisely because they have been warded off. Their cognitive activation triggers feelings that require regulation, and one way people try to regulate them is through avoidance. As Wegner's (1992) research suggests, however, this strategy actually maintains a heightened level of activation. Keeping representations of traumatic events chronically active necessitates chronic activation of affect-regulation strategies, creating a cy-

cle that cannot easily be broken without conscious exposure to the feared representations.

What this analysis suggests, then, is that conscious activation is not simply a function of level of cognitive activation, in which crossing a threshold brings representations into consciousness. Rather, conscious activation is probably a joint function of (a) cognitive activation (priming), (b) affective attention to emotionally significant events, (c) affective inhibition of unpleasant information (which can run counter to attention to emotionally significant events), and (d) affective excitation of pleasurable information. It is probably no accident that regions of the prefrontal cortex contiguous to those involved in directing action and attention receive projections from limbic structures that guide approach and avoidance to both environmental events (through motor behavior) and internal events (through attention and consciousness). Individuals differ substantially in the extent to which they are comfortable with or seek cognitive ambiguity, unpleasant feelings, and positive affect, which means that people will differ in the computations that lead to conscious activation.

Connectionism and the Psychodynamics of Parallel Constraint Satisfaction

These considerations suggest what is probably the most important area of potential integration of empirically validated psychodynamic principles into mainstream psychology, the integration with cognitive science, which is the closest thing to a paradigm in psychology in the Kuhnian sense (see Robins & Craik, 1994). In this section, I highlight the importance of psychodynamics for understanding affective and motivational processes that could be readily assimilated into connectionist models in cognitive science.

Associations and Equilibration in Psychodynamic and Connectionist Models

Psychoanalysis and connectionism share a common ancestor: associationism. Although these two descendants may at first glance seem like very divergent branches on the family tree, the family resemblance may have some important implications.

When Freud developed the method of free association as a therapeutic tool, a primary aim was to bypass the conscious theories that patients held about their minds and symptoms and to try to map the structure of their associational networks. In contemporary practice, if a patient presents with some form of avoidance—difficulty completing projects he actually wants to complete, sexual anxiety and attendant avoidance of situations that might lead to sexual encounters, anxiety about spending money on herself, and so forth—a psychodynamic therapist is likely to explore specific instances and, for each, to follow the trail of associations until patterns begin to emerge that may provide insight into the cognitive-affective associations underlying the avoidance. The assumption is that if a person does not know why he is avoiding something he consciously wants to do, then at some level the action must be associated with a fear (or with something else associatively connected to it that itself is fear-inducing). Because associational networks are not available to introspection, the only way to try to map them is to see what thoughts, feelings, memories, images, and so forth emerge

when the person relaxes consciousness and simply says whatever comes to mind. Thoughts or memories that themselves elicit avoidance during this process—that come to mind but that the patient does not want to divulge—are likely to be particularly relevant because they are not only associatively connected but also linked to some kind of unpleasant feeling.

Although cognitive models have not traditionally been attentive to these more motivational processes, the link between Freud's free-associational method and many cognitive procedures for trying to map the implicit organization of associative networks should be clear to any cognitive scientist. Cognitive psychologists use measures such as reaction time following priming to assess the degree of association between two nodes on a network (e.g., *bird* and *feathers*), and there is no reason that one would not expect meaningful idiographic data similarly to emerge by ease of activation of specific associations to a prime (a memory, dream element, symptom, feeling, etc.).

An important point of complementarity between psychodynamic and connectionist models is that the former have elaborated on the role of affect and motivation in associative processes, whereas the latter have focused on the role of more cognitive and perceptual constraints. Despite their very different foci, however, the two approaches share certain features that make integration not only possible but potentially very useful.

First, both assume that psychological processes occur simultaneously, in parallel, but also presume a serial processing capacity (consciousness) superimposed on a parallel architecture. Second, both assume that psychological processes active below the threshold of consciousness at any given time can move the system in competing directions and that the result is an equilibrated solution to multiple and potentially competing forces. In connectionist models, this means that a process such as categorization occurs through the simultaneous activation of units of information (nodes) that can excite or inhibit each other. In psychoanalytic theory, a person can attach multiple evaluative responses, and hence have competing motivational tendencies, toward the same object and is likely to construct a compromise solution to this affective-motivational "problem" outside of awareness. For example, a person can channel competitive or aggressive impulses into socially acceptable practices, such as sports or academic achievement.

A third premise shared by both approaches is that the meaning of an object, concept, or behavior is not contained in any single unit or dynamic but can be understood only in terms of a broader configuration. In PDP models, the meaning of an object is distributed throughout a network of processing units that, through experience, have become activated in tandem. Each of these units attends to some small aspect of the representation, and none alone "stands for" the entire concept. From a psychodynamic perspective, the meaning of any conscious belief, feeling, behavior, or symptom can be understood only in the context of the dynamic interplay of unconscious processes that create it.

Although these similarities may seem more like analogies than shared features, in fact they reflect an underlying holistic, equilibratory, dynamic, and field-systemic approach that Read, Vanman, and Miller (1997) have recently argued is shared by connectionist and Gestalt models in perception and social psychology. In each case, a unified "decision"—whether an approaching insect can be categorized as a moth or whether a

symptom or conscious belief represents a stable if not optimal solution to a conflict—is an equilibrated solution emerging from a configuration of dynamic processes active outside of awareness.

Cognitive and Affective Constraint Satisfaction

From the present perspective, of particular importance with respect to the potential utility of psychodynamic constructs is the notion of parallel *constraint satisfaction* central to most connectionist models. Constraint satisfaction refers to the tendency to equilibrate to a solution that satisfies as many constraints as possible in order to achieve the best fit to the data. The nodes in a PDP network essentially represent hypotheses as to the presence or absence of a given feature (Read et al., 1997). The hypothesis can be as simple as whether a line has a horizontal orientation or as complex as an inference about whether a particular tone of voice was intended as an insult. The links among nodes are weighted, and these ever-changing weights represent the extent to which the information in associated nodes is mutually supportive or conflicting. These weighted links reflect the extent to which the two nodes have been coactivated, and they increase the more times two nodes are activated in tandem. Uncorrelated units of information will have weights of zero connecting them, whereas units of information that tend to covary will have strong positive weights, so that activating one will spread activation to the other. Nodes that represent incompatible (negatively correlated) information (such as a hostile tone of voice and a friendly facial expression) will have negative weights connecting them and thus inhibit each other as activation spreads from one to the other. If, however, a person's experience changes so that two objects or representations no longer tend to covary or contradict one another (as when a conditioned stimulus is no longer paired with the unconditioned stimulus and hence no longer predicts its presence), the weight will gradually move toward zero.

Psychodynamic theory can augment a connectionist model in proposing that affects and affectively charged motives provide a second set of constraints, distinct from strictly cognitive or informational ones, that influence the outcomes of parallel constraint-satisfaction processes. The decisions people implicitly make as they are confronted with tasks of categorization, inference, problem solving, and so forth are constrained not only by the data but by the *hedonic significance* of different decisions. According to this integrated view, the mind is not only cognitively self-regulating but affectively self-regulating.

For example, Ali Feit and I (Westen & Feit, 1998) recently completed a study in which we attempted to predict participants' beliefs about what happened between President Clinton and Kathleen Willey, who accused him of sexual harassment, in the week after the scandal broke. We hypothesized that the extent to which people believed Willey's version of the events would reflect some combination of cognitive constraints (what they know about Clinton and the scandal) and affective constraints imposed by their feelings toward the Democratic and Republican parties, Clinton, infidelity, and feminism. We assessed cognitive constraints by asking participants 10 factual questions about Clinton's life that would indicate longstanding knowledge about his political and personal history and 10 factual questions

about the scandal (such as how Willey's husband died, how much she had sought as a book advance, etc.). We assessed affective constraints by asking multiple questions about participants' feelings toward the Democrats, Republicans, infidelity, feminism, etc. and by factor analyzing their scores on these variables.

As predicted, beliefs about the Willey affair reflected a compromise formation, or equilibration process, that yielded a conscious solution that minimized negative affect but did not completely disregard the facts. Three variables predicted beliefs and certainty about what happened: feelings toward Democrats and Republicans ($\beta = .46$), feelings toward high-status men who philander ($\beta = -.38$), and knowledge about Clinton's life ($\beta = .28$), with a multiple $R = .63$ ($R^2 = .39$). In other words, the less participants liked Republicans, disliked philandering men, and knew about Clinton, the less likely they were to construct the belief that he had molested Willey in the Oval Office. In this case, cognitive constraints were actually less influential than affective constraints in shaping conscious judgment.

Similar ideas and data are beginning to emerge in the cognitive literature as well as in research in social and personality psychology (see Kunda & Thagard, 1996; Mischel & Shoda, 1995) as researchers are increasingly recognizing the role of affect and motivation in constraint-satisfaction processes. Perhaps the best example is Holyoak and Thagard's (1989) model of analogical reasoning—the process by which people understand a novel situation in terms of a familiar analog—through implicit selection of the best fitting of multiple relevant analogs stored in memory. For example, during the Gulf War, U.S. President George Bush compared Saddam Hussein to Hitler; if one accepts this premise, then Iraq's invasion of Kuwait was like Germany's invasion of its neighbors at the start of World War II, which implied that Saddam had to be stopped before becoming a danger to the world (Spellman & Holyoak, 1992).

According to Holyoak and Thagard (1989, 1997), selecting the best fitting analog is a constraint-satisfaction process that involves three sets of constraints. Two are cognitive: The current situation must be similar enough to the analog stored in memory to activate it, and the elements of the novel situation and the analog must be readily mapped onto each other. Thus, Iraq's occupation of Kuwait did not activate the analog of one team defeating another in a soccer match, because Kuwait was not a willing participant in the "game." The third constraint is motivational: the reasoner's goals. Had President Bush not wanted to intervene after the Iraqi takeover of Kuwait, he could easily have chosen a different analog, such as the Vietnam analog that blocked U.S. intervention in many similar international confrontations for two decades. In a paragraph that makes clear the resemblance between this approach and Freud's concept of compromise formations, Holyoak and Thagard wrote that these three kinds of constraint satisfaction function "like the various pressures that guide an architect engaged in creative design, with some forces in convergence, others in opposition, and their constant interplay pressing toward some satisfying compromise that is internally coherent" (1997, p. 36). That Bush chose the analog of World War II instead of Vietnam is probably no accident, because he had fought in World War II and its memory was likely associated with much more affect. Experimental research in fact has begun to document that manipulating partici-

pants' goals changes their analogical mappings when confronted with ambiguous situations that could be mapped in more than one way (Spellman & Holyoak, 1996).

A psychodynamically informed connectionist model can be applied to a range of phenomena described in the empirical literature, some of which was reviewed previously, such as self-serving biases. With self-serving biases, one of the constraints that enters into the equation is that the conclusion should maximize positive feelings about the self and minimize negative feelings. A solution that is too far afield from reality as the person has experienced it will likely elicit a connectionist version of cognitive dissonance (see Shultz & Lepper, 1996; E. R. Smith, 1996), whereas a solution that threatens self-esteem will elicit *affective dissonance*. As a result, a person is likely to be drawn to a conclusion that compromises affective considerations with accuracy. As Morling and Epstein (1997) have shown, this is precisely the kind of compromise that tends to occur when people make judgments about themselves.

This kind of model is also capable of handling individual differences, such as the tendency of narcissistic individuals to rate themselves much more positively than objective observers rate them on a variety of dimensions and the tendency of people with a depressive bent of mind to underrate themselves (John & Robins, 1994). For narcissists, the threat to self-esteem of realistic appraisals is strong enough that affective considerations can override accuracy considerations more easily than they do for most people, who only moderately self-enhance. This suggests, as long argued by psychoanalytic clinicians, that beneath the conscious grandiosity of the narcissist is usually a fragile baseline of implicit or unconscious self-esteem or a pervasive deficit in the capacity for self-esteem regulation (Kernberg, 1975; Reich, 1960; Westen, 1990b). Clinically, affect appears to have particular power to alter the configurations of equilibrated solutions, and the extent to which this is the case depends on the person, the affect, the intensity of the affect, and the chronically activated issues that trigger strong aversive affective reactions.

For some depressive individuals, whose affective "pulls" often run in the opposite direction of the narcissist's, affective constraint-satisfaction processes are likely to override accuracy considerations in the opposite direction. Cognitive models of schematic processing have never adequately explained this phenomenon because thinking bad things about oneself is so unpleasant that such schematic processes would surely be extinguished over time through operant conditioning mechanisms, giving way to the moderate self-enhancement characteristic of most people. From a psychodynamic perspective, motivated avoidance of positive thoughts and feelings about the self is likely to reflect identification with a critical parent, a learning history in which pride and self-esteem were associated with feeling fraudulent, being disappointed at the lack of response from (or criticism by) parental figures, guilt at outdoing a significant other, activation of wishes for more esteem from significant others that the person has learned to expect not to be forthcoming, fear of subsequent humiliation, and so forth (Westen, 1985, chapter 2; Westen, in press-a). These motivational factors, like those that lead to distortions in processing information about the self in narcissistic individuals (who similarly have problems regulating self-esteem but have different preferred solutions), can be readily integrated into a connectionist model

that views data-fitting and hedonic value as two sets of constraints that influence information processing, often in opposing directions.

As suggested above in the discussion of the multiple meanings of *activation*, a psychodynamically informed connectionist model would also distinguish more carefully between implicit and explicit products of equilibrated solutions. Just as narcissistic individuals can respond to perceived failures with defensively grandiose conscious self-representations, people can hold positive explicit beliefs about negatively stereotyped groups that are incompatible with their implicit stereotypes. In each of these cases, the system has settled on two solutions, one at odds with the other. (Alternatively, one might consider the combination of the two incongruent representations to be a single equilibrated solution.)

Methods and Data

Elsewhere I have described some of the methodological implications of taking psychodynamic constructs more seriously, particularly the notion that emotions and motives can influence behavior outside of awareness and that people can regulate their affects unconsciously (e.g., Westen, 1995, 1996, 1997; Westen et al., 1997). The overreliance on self-reports in personality, clinical, and attitude research can no longer be maintained in the face of mounting evidence that much of what we do, feel, and think is inaccessible to consciousness; indeed, on the basis of neuropsychological data on the generation of fear responses, LeDoux (1997) has made precisely the same point. Here, however, I briefly highlight a very different implication for psychological methods and data of integrating psychodynamic thinking into mainstream psychology, more at the level of philosophy of science.

Psychoanalytic theorists have been describing, categorizing, and exploring the workings of unconscious mental processes for a century, whereas the existence of these processes has just been acknowledged in mainstream research in psychology in the last decade. This should give us pause to wonder whether the implicit, if not the explicit, philosophy of science that guides our work requires some revision. We explicitly acknowledge in introductory psychology and methods texts that case studies are a legitimate form of psychological inquiry, albeit one open to bias. However, our implicit attitude—expressed, for example, in the absence of descriptions of anything other than neurological (i.e., “hard science”) cases in APA journals—bespeaks an attitude toward data that can only be understood in historical context.

In the late 19th century, when psychology emerged from philosophy as a discipline, psychologists were determined to turn psychology into an objective science that could answer questions empirically rather than through the seemingly endless speculations of one philosopher after another about the nature of mind, knowledge, free will, innate ideas, and the like. Psychophysics provided a model of how this could be done, and early psychologists such as Titchener were determined to route subjectivity out of psychological science. Behaviorists took this a step further, and although cognitive psychologists are now gradually letting emotions and motives back into what began as a cold, cognitive mind, there remains in academic psychology a perva-

sive antipathy toward data from the clinic, clinical inference, and especially psychoanalytic modes of inference.

Anyone who reads the psychoanalytic literature can readily see the perils of developing theory and making inferences without the constraints imposed by a more systematic empirical attitude. Operationalizing variables not only allows one to test hypotheses but forces one to clarify the meaning of one's constructs. Everything Titchener, Watson, Skinner, and others appropriately wanted to avoid can be seen routinely in the pages of even the best psychoanalytic journals. On the other hand, it is no accident that psychoanalysts have been making some very sophisticated observations about unconscious processes for decades, whereas experimental psychologists have only recently acknowledged their existence. Researchers are now discovering, for example, that word associations can provide a way of assessing individual differences in the linkages among concepts in memory (Stacy, Leigh, & Weingardt, 1997).

Clinical observation provides a remarkably important, even if at times foggy, window to the operations of the mind. The reason is that it allows observation of individuals who are motivated to disclose their most personally significant and affect-laden experiences longitudinally for months or years as they describe their experiences; offer associations to thoughts or feelings they cannot consciously explain; and express patterns of thought, feeling, motivation, and behavior in their interactions with a significant other with whom they have considerable rapport and who has considerable experience with the way they behave and impose meaning on events. None of this can be obtained through other commonly used methods.

The philosophical and methodological issue is, I believe, essentially one of signal detection: At what point does one report a hit—that is, take an observation as credible enough to include in formulating a theory or model—or dismiss a potentially significant piece of data as noise? For reasons that can only be understood in the context of their respective histories—consistent with the signal detection analogy—I would argue that psychoanalysis has chronically set the threshold far too low, whereas experimental psychology has set it too high. A more pragmatic philosophy of science might consider clinical observations as potentially relevant data, particularly when they appear to disconfirm or suggest modifications in current thinking (because disconfirming instances need not be experimental), while not according these data the evidentiary weight of more systematic scientific observations.

Psychodynamic theory and observation is, I believe, extremely valuable in one other respect. Philosophers of science often distinguish between (a) the context of scientific discovery, in which initial observations are made and hypotheses are framed, and (b) the context of justification, in which hypotheses are tested by use of the scientific method. I have just suggested, essentially, that we not ignore clinical data in the context of discovery. Clinical data may, however, be useful in another respect suggested by a century of psychodynamic thinking and observation. In the human sciences, one could argue that alongside the more familiar context of scientific justification is an *interpretive context of justification*, in which a theory demonstrates its relative superiority to lay theories or competing scientific theories if it can confer intelligibility to otherwise less intelligible phenomena by offering principles for drawing infer-

ences about the meanings that guide behavior. In this view, *prediction and control* and *interpretive understanding* are two ways of knowing that one knows something about people, even if their evidentiary weights are not equal.

Conclusion

So what conclusions can one draw about the legacy of Sigmund Freud a century after he began his inquiries into human nature? The answer is complex. Freud advanced several fundamental propositions, once highly controversial and unique to psychoanalysis, that have stood the test of time, and many of the implicit and explicit assumptions today at the heart of the school of thought he initiated have a considerably stronger empirical basis than has been widely supposed. This is probably the best any thinker could hope for in a rapidly developing discipline like ours 60 years after his death. No doubt, many psychoanalytic writings are obscure, muddleheaded, and ignorant of relevant empirical work. But clinical investigation has led to a set of propositions about the mind, now well verified empirically, that can inform the experimental investigation of human mental life and behavior and the theories that drive and derive from it. In particular, a wedding of psychoanalysis and cognitive science might produce some important, if unlikely, offspring.

Was Freud wrong in some of his fundamental ideas about human nature? Without doubt. His theory of drives was highly problematic, his view of aggression was far too mechanistic, his hypothesized death instinct was evolutionarily untenable, his theory of development was too exclusively focused on sexuality, his theory of female development was simplistic, and so on. Fisher and Greenberg (1996, pp. 19–21) have recently distilled and laid out in propositional form the general theory of psychopathology that Freud proposed, and I must admit that as a practicing dynamically oriented clinician I can scarcely find any proposition on their three-page list with which I agree even remotely.

Grand theorists like Freud, Piaget, and Skinner are routinely the grandest purveyors of falsehood in the business. This reflects simple mathematics: The more propositions one advances (and the bolder those hypotheses are), the higher the probability that several will be wrong.¹⁶ But on some of the central postulates of psychodynamic theory, such as the view that much of mental life is unconscious, Freud has left an important—and I believe indelible—mark on human self-understanding. As psychology moves into its second century, we would do well to attend to and integrate some of these disavowed psychodynamic ideas, which need not remain, like classic psychodynamic symptoms, outside the consciousness of the scientific community.

¹⁶ Popper (1957) was right in prescribing that scientists make risky, falsifiable predictions, but he neglected to consider the relative contributions of broad versus circumscribed theories. The philosophy of science he proposed, and that most psychologists tacitly accept, is biased toward microtheories devoid of a broader paradigmatic context because these theories are the most likely to withstand efforts at falsification.

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