

# Deep Cognitive Activation: A New Approach to the Unconscious

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Deep cognitive activation occurs when a thought is so accessible as to have measurable effects on behavior or judgment, but is yet not consciously reportable. This state of mind has unique properties mimicking some characteristics of the psychoanalytic unconscious, but following theoretically from a consideration of processes of cognitive activation. The sources and consequences of deep cognitive activation are examined, with a view toward understanding how this state is implicated in the assessment, etiology, and treatment of psychopathology.

Thoughts and ideas can have an active influence on people's minds even when they are not in consciousness—and sometimes they do so precisely because they are not in consciousness. This assertion is familiar to anyone who has ever heard the word *psychoanalysis*, but it may not inspire much faith no matter how familiar the word. Much has been said about the unconscious, after all, but often on the basis of the flimsiest of evidence, and this has left many wondering whether the concept is useful. As it turns out, however, new data accumulating from cognitive research methods provide a more substantial basis for proposing and evaluating theoretical claims about the nature of the unconscious mind. These data suggest that it is useful to introduce the notion of *deep cognitive activation* as a means of portraying the unconscious.

In deep cognitive activation, a thought is accessible or primed—in the sense that evidence can be found for its influence—yet this same thought is not reportably conscious. For example, a person may try not to think about something for a while and eventually achieve a modicum of success, in that the thought does not appear in the person's report of conscious thought content. Yet subtle measures indicate that this thought is still interfering with others or influencing their expression, and so can be deemed accessible despite the lack of consciousness (Wegner & Erber, 1992). Deep cognitive activation is a volatile state of mind, then, a tendency to think that does not carry with it the occurrence of the conscious thought. Like the unconscious of Freud and his forebears (see Ellenberger, 1970; Erdelyi, 1985), deep activation involves two key elements: the presence of something in mind, and absence of that thing in the conscious

mind. The notion of deep activation is introduced here to make the duality of this definition explicit.

Our discussion of this new approach to the unconscious begins with a brief look at the old approach—the measurement of the unconscious through projective techniques—and then turns to an analysis of the forms of cognitive activation and the causes of these forms. We then examine the manipulation and measurement of deep activation, review recent evidence on how it operates, and examine its role in psychopathology. As we shall see, research based on techniques now available for manipulating and measuring deep activation suggests that there are fundamental ways in which this state of mind is implicated in a variety of psychopathologies.

## Measuring the Unconscious

The theory that there is an unconscious mind has always had to face an essential measurement problem: If a person cannot or will not report some mental state, thought, or proclivity, how can it be established that such a thing exists? The inference that there is an unconscious mental mechanism, then, has traditionally had to rest on the observation of behaviors that either oppose the person's conscious mental activity or are unanticipated by the person's reports. If the person does something that he or she cannot consciously report wanting to do or thinking about, perhaps that behavior has origins in the unconscious mind (cf. Nisbett & Wilson, 1977). In the 19th century, for example, the occurrence of automatic writing and drawing, or of hypnotic behaviors that conflict with conscious reports, was taken as evidence for unconscious processes (Carpenter, 1876).

The habit of peeking under consciousness at what might lie beneath began in earnest in psychology with the use of projective measures. Rorschach's (1921/1942) inkblot technique, Machover's (1949) Draw-a-Person test, and Murray's (1938) Thematic Apperception Test (TAT) are the major examples of measures intended specifically to elicit behaviors that might not be consciously reportable. The logic of these and similar techniques is summed up by Murray's (1943) description of the TAT as a

method of revealing to the trained interpreter some of the dominant drives, emotions, sentiments, complexes, and conflicts of personality. Special value resides in its power to expose underlying inhibited tendencies which the subject is not willing to admit, or cannot admit because he is unconscious of them. (p. 1)

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This well-known rationale for projective techniques is accompanied, however, by an equally well-known history of controversy and disappointment in the effectiveness of such techniques. Although projective testing continues to have its champions (e.g., Exner, 1993; McClelland, 1980), critics of the technique point to its poor reliability and variable validity (e.g., Dawes, 1994; Mischel, 1968; Scott & Johnson, 1972).

These problems are not surprising in view of the difficult task the projectives are designed to perform: They must find some behavioral indication of unconscious content that can be observed reliably, but that does not cause the test-taker to become conscious of the content. For this to happen, the behavioral indicator must be sufficiently close in meaning to the unconscious mental content that it is a convincing sign of such content. At the same time, if the indicator is too obviously related to the unconscious mental content, its elicitation during the test may lead the test-taker to realize consciously that this thought is present—and this, of course, spoils the “unconsciousness” of the thought. In the pursuit of reliability of measurement, in turn, the attempt to produce multiple such behavioral indicators can even increase the likelihood that the content will be consciously apprehended. Ideally, the projective test should contain some way of guaranteeing that the thought is indeed not in the test-taker’s conscious purview at the time of the test, but such niceties are far beyond current technology.

Our new approach is to suggest a strategy for measurement of the unconscious—one that draws in part on the logic of projective measurement, but that uses contemporary cognitive-psychological techniques to capture indications of unconscious mental content. Measurements must be made that are too fast or confusing for consciousness, or that simply bypass it entirely. Just such new techniques are now widely available through methods used in the study of automatic forms of cognitive activation (e.g., Bargh & Chartrand, in press; Wegner & Bargh, in press). The further strategy used in this new approach is to depend not just on cognitive measurement, but also on the manipulation of mental states through instruction—as when people are asked, for example, to clear consciousness of a particular thought (e.g., Wegner & Wenzlaff, 1996). These measurement and manipulation techniques can be orchestrated to activate unconscious mental contents while keeping those same contents out of consciousness. To appreciate these techniques, it is useful to examine the nature of cognitive activation.

### Cognitive Activation

There are essentially two ways in which a thought can be conceptualized as “active.” The most obvious sort of activation is *consciousness*: If a person can report having a thought, then this is pretty darn good evidence that it is somehow active in the person’s mind. Only a limited amount of material can be conscious in this sense at any one time, of course, as the size of this window of attention is restricted during a particular instant. The length of time the thought is rehearsed in consciousness, or the number of recurrences of the thought to consciousness in an interval, for example, may be taken as measures of the degree of such conscious activation. Methods described in several of the articles in this issue—such as thought sampling, think aloud or stream-of-consciousness, thought listing, and the

like—are commonly understood as reflections of such conscious activation.

The second sort of cognitive activation is the readiness to think of something consciously (cf. Bruner, 1957; Higgins, 1996; Higgins & King, 1981). Such *accessibility* to consciousness is not measured by reports of the thought in consciousness, but rather by observations of the unconscious or preconscious influences of the thought on related judgment or behavior. These measures trade on the notion that an accessible thought is so quickly and easily brought to mind that it can influence a variety of mental processes before the conscious recognition of the thought’s occurrence. In this sense, the notion of accessibility is related to the concept of *priming*—the idea that exposure to one thought may make another more likely to occur (cf. Meyer & Schvaneveldt, 1971; Segal, 1967). However, accessibility may occur for reasons other than prior exposure (e.g., habit), and so is the broader concept.

Cognitive accessibility can be gauged by measures of the interference of the thought with other tasks (e.g., Warren, 1972), measures of whether the meaning of other thoughts is bent toward the target thought (e.g., Sherman, Mackie, & Driscoll, 1990), measures of the earliness of conscious recurrence of the thought in comparison to others (Lane & Wegner, 1995), or measures of the influence of the thought on behavior (e.g., Bargh, Chen, & Burrows, 1996), to name just a few. For many such measures, further steps are taken to guarantee that conscious activation is in fact not present—for example, through the very brief presentation of prime stimuli (e.g., Murphy & Zajonc, 1993), or the imposition of response time pressure (e.g., Bargh & Thein, 1985). These various techniques allow the precise partitioning of the two forms of cognitive activation, namely, conscious presence and unconscious accessibility.

### Modes of Cognitive Activation

The distinction between these two ways of measuring cognitive activation suggests that at any particular moment, a person’s state of cognitive activation can be characterized completely by knowing both what is conscious and what is accessible (see Figure 1). To begin with, one can speak of the *full activation* of a thought if it is both conscious and accessible. The thought is both conscious and ready to continue coming into consciousness. This state of complete absorption appears when one is deeply preoccupied with the topic that one is currently thinking

	Conscious Presence	Unconscious Accessibility
Full Activation	✓	✓
Surface Activation	✓	
Deep Activation		✓
No Activation		

Figure 1. Modes of cognitive activation.

about consciously. Such a state would seem to be most likely for pleasant topics of thought such as sex, love, fame, money, or the like, as these things might well be kept in consciousness for some time, not to be suppressed or avoided in some cases even when they are being reintroduced to mind at a merry rate by virtue of a high level of accessibility. Full activation seems to involve a sort of self-indulgence, then, a reveling in thoughts that are actively coming to mind. Unpleasant thoughts, in contrast, might only achieve full activation when a person is forced by circumstance to entertain them consciously. Despite their potentially high levels of accessibility (Pratto & John, 1991), thoughts that portend negative emotion could often be robbed of full activation by the individual's attempts to control consciousness of them (Wegner, 1992).

It seems to be a common mistake in the literature on cognitive approaches to clinical psychology to assume full activation from any measure of activation. So, for example, one might observe conscious presence of a thought in a think-aloud protocol and assume this means the thought is accessible, or one might infer from the accessibility of a thought in some automatic activation paradigm that it is likely to dominate consciousness. These are potential errors. Although there are no doubt everyday states of full activation, these may be the exception rather than the rule, and the inference that a cognitive influence anywhere in the mind predicts an influence anywhere else is likely to be a serious overgeneralization of the notion of "activation." To appreciate the possibility that not all cognitive measures converge on the same thing, it is helpful to examine important departures from full activation.

One interesting case is what may be called *surface activation*. This occurs when the person is thinking about something consciously, while at the same time that thought is not highly accessible. Such a state of mind could easily accrue when the person is actively pursuing mental control. With the exertion of effort, for example, one might concentrate consciously on something that is basically not very interesting. Surface activation could also occur in the suppression of some other thought—as when one uses a particular conscious thought (e.g., the thought of a beach) as a distracter from something else that is more accessible (e.g., the thought of the dentist working on one's tooth). The thought that achieves such surface activation is often irrelevant to whatever is being suppressed or avoided, and may soon be pushed out of consciousness by the more insistently accessible suppressed thought. Surface activation often arises as a kind of self-distraction (Wegner, 1989) or low-level thinking (Pennebaker, 1989)—the superficial state that appears, for example, when one talks about the weather or other niceties in the pursuit of freedom from weightier matters.

The notion of surface activation makes sense only if unconscious accessibility is appreciated as a propensity toward conscious presence. At one point in time, for example, the thought of an apple might be consciously present, whereas the thought of an orange might be "next in line" for consciousness. Unconscious accessibility can be viewed as a name for this propensity, and it is in this sense that it is reasonable to propose that a thought may be consciously present without being accessible. Surface activation, in this light, is a state inclined toward change—a movement from apples to oranges. The idea that

there is such a state offers an explanation of why the mind wanders (Wegner, 1997b).

The third mode of cognitive activation is *deep activation*, the topic of this article. Deep activation is what the designers of projective tests had hoped to be able to distinguish from the fourth case in our analysis—the state of no activation at all. In deep activation, a thought is accessible, but is not currently conscious. This state is unstable, in that it represents a combination of a tendency to think about something with the failure to think about that very thing. For this reason, it is easy to suspect that most cases of deep activation are maintained in some way, either desired by their possessors or kept in position by ongoing environmental stimulation. Deep activation requires some sort of temporary circumstance that keeps the thought out of consciousness even while that thought is unconsciously activated and thus likely to pop into consciousness at any time. It may often be that deep activation occurs for brief periods as a point of transition before full activation, when the accessible thought does come into conscious presence.

### *Sources of Activation*

The mode of activation a thought achieves is determined in part by how the activation occurs. For this reason, it is useful to distinguish between several sources of cognitive activation and examine their implications for modes of activation. In particular, it is worth considering whether there are sources of cognitive activation that are regularly likely to prompt deep activation.

The most obvious source of cognitive activation is *perceptual input*. Studies of accessibility and of consciousness often trace the production of thoughts to perception, and it appears that simple perception may lead to any of the modes of activation. It is not particularly surprising that frequent or recent priming of a concept can produce activation of that concept in mind at the conscious level (e.g., Lombardi, Higgins, & Bargh, 1987). No one seems to have tried to establish whether such conscious effects can occur in the absence of accessibility, so we really don't know whether surface activation can occur in this way. However, there do seem to be plenty of cases of conscious perceptions that hold little deep or abiding interest—like TV commercials or chitchat in the grocery line—and it makes sense that these might represent moments of surface activation. Deep activation can also be produced through perceptual input, as there is evidence establishing that perceptual input can yield accessibility without consciousness (e.g., Greenwald, Klinger, & Schuh, 1995). Such deep activation might tend to be weak and short-lived, though, because it would naturally tend to decay into full activation (if the percept is sufficiently primed that it becomes conscious) or no activation (if the percept never gains sufficient accessibility to prompt conscious intrusion).

A second source of cognitive activation is *chronic or habitual activation* (Bargh & Barndollar, 1996; Bargh, Bond, Lombardi, & Tota, 1986). Each person seems to have a chronic array of active thoughts, ones that are accessible all the time. Depending on the person's motivation to allow these thoughts into consciousness or to try to control them, chronically accessible thoughts may or may not appear in consciousness as well. It is probably safe to say that for many thoughts that are chroni-

cally accessible, their occurrence in consciousness sets off no special alarms. A person may have certain interests or preferences, for example, that often move directly from unconscious accessibility to conscious thought, and these are therefore often fully activated. It would be especially difficult to live a life in which chronically accessible thoughts are not desired in consciousness, thus yielding chronic deep activation—but this is probably the state of many individuals who suffer from certain psychopathologies (Wegner & Zanakos, 1994). Unwanted thoughts come to mind again and again, only to be ushered out of consciousness through intentional thought suppression.

A third source of cognitive activation is *intentional activation*, the operation of mental control (Wegner & Pennebaker, 1993; Wegner & Wenzlaff, 1996). Mental control occurs when people influence their conscious thoughts in accord with their conscious priorities for thinking. In the case of thought suppression, the person attempts intentionally to remove some item from conscious presence, and usually does so by trying to concentrate attention on distracters (Wegner, 1989, 1992; Wegner, Schneider, Carter, & White, 1987). In the case of concentration, in turn, the person attempts intentionally to retain some item in conscious presence, and may do so by rehearsing it or elaborating on it in consciousness, and by suppressing distracters (Wegner, 1997b). These various activities require mental capacity, and so can only be achieved when the person has the mental resources to devote to the task. But with proper resources, mental control often does work quite effectively, at least in the sense that it can produce intervals in which the desired conscious state of mind is achieved.

The odd feature of mental control is what it does to accessibility, even while it influences consciousness in the intended direction. Intentional mental control introduces an ironic monitoring process that increases the accessibility of the very thoughts that are least desired in consciousness (Wegner, 1994). The attempt not to think about a house, for example, ironically increases the accessibility of that very thought, in that it increases the likelihood that the word *house* will be given to a prompt such as *home* in a speeded word association task, and decreases the speed with which the individual will be able to name the color in which the word *house* is printed during a Stroop interference task (Wegner & Erber, 1992). These effects accrue primarily when the person is under mental load (such as during a parallel task, under stress, during distraction, or with time pressure), as such load interferes with the person's strategic mental control activities while leaving the more automatic ironic monitoring process unscathed. There is a wide array of such ironic effects of mental control (Wegner, 1994), indicating that ironic activation is a likely pathway to accessibility whenever mental control is attempted during mental load.

Ironic activation can yield conscious presence, of course—as when, for example, a person tries not to think about a white bear and then finds it returning frequently to mind (Wegner et al., 1987). The recurrence of unwanted thoughts in consciousness is a clear indication that the accessibility prompted by ironic activation can yield full activation of a thought. If, however, a person remains motivated to influence consciousness through mental control, the continued exertion of mental control yields a state of deep cognitive activation. This is the consequence of the ironic monitoring processes that are marshaled in the pursuit

of mental control. When a person tries to suppress a thought, for example, distracters will be intentionally activated in consciousness while, at the same time, the unwanted thought itself will be ironically activated below consciousness; this is surface activation of the distracters, with deep activation of the unwanted thought. By the same logic, when a person tries to concentrate on a thought by bringing it to conscious presence, the distracters the person might conceivably entertain will be ironically activated, thereby achieving unconscious accessibility; this is surface activation of the desired target, with deep activation of the distracters. This ironic occurrence of deep activation may be why trying to diet, to control a drug habit, to overcome a phobia, to stop having morbid thoughts, to fall asleep, or to serve any of a variety of other mental control goals can be so vexing. Ironic activation always runs counter to what the person desires to have in consciousness, yielding the troublesome state of deep cognitive activation.

The theory of ironic processes of mental control (Wegner, 1994) suggests that this happens because of the architecture of the system whereby people achieve intentional control of mind. Such mental control proceeds through the interaction of an intentional operating process and an ironic monitoring process. The operating process is conscious, effortful, and capable of being inhibited, and so can be undermined by distracters or other forms of mental load; the ironic monitor, in turn, is unconscious, less effortful, and not open to inhibition as long as mental control is exerted, and so runs automatically in the background without being influenced by mental loads. Normally, the processes function together as a feedback unit to produce mental control.

Consider a person trying not to be depressed. This individual might expend conscious effort in the form of an operating process that searches for nondepressed thoughts, and the search could succeed, thereby launching the person into happy or at least neutral thoughts and affect. Meanwhile, however, the monitoring process would search automatically for preconscious depressed thoughts by scanning memory and environmental cues. When the monitor encounters such sad thoughts, it brings them into consciousness to restart the operating process, and the person begins again to think of things that are not so sad. Over time, the cyclic interplay of the processes moves, in fits and starts, to keep depressing thoughts out of mind. The monitoring process serves as a watchful eye for failure of mental control. With the imposition of mental load, however, the inefficient and effortful operating process is disabled, thus yielding ironically depressed intrusions due to the monitor (Wegner, Erber, & Zanakos, 1993). Mental loads imposed in the laboratory may include tasks such as rehearsing a number, listening to distracting music, or taking a stressful mental test. Mental loads that produce ironic effects in daily life might include not just stresses or distractions, but also alcohol or other drugs that influence attention, and any dispositional tendencies toward poor attention.

Research has uncovered evidence of deep activation not only in response to mental control instructions, but also as a result of the natural desire people have to control their minds. Consider, for instance, research on people who have been asked to think about their own death. This is a topic people might naturally not want to think about, of course, so when they are forced

by the demands of an experiment to do so, they might soon start to suppress this thought of their own accord. Greenberg, Pyszczynski, Solomon, Simon, and Breus (1994, Experiment 4) asked people to think about death, and then measured accessibility by examining the tendency to complete word fragments (e.g., COFF\_\_\_\_) in death-related ways (i.e., COFFIN) or unrelated ways (i.e., COFFEE). It was found that accessibility was low immediately following the thinking task, and then climbed to a higher level following a distraction task. The distraction task apparently undermined the efforts at suppression of the thought of death, and thus ironically enhanced subsequent accessibility. This, then, appears to be a case of the natural production of deep activation. Further studies by Arndt, Greenberg, Solomon, Pyszczynski, and Simon (1997) have substantiated this conclusion and indicate that deep activation is particularly likely to result from death thoughts when people experience a mental load when death is made salient. People who are released from such load, in contrast, do not show the ironic activation of the unwanted thought of death.

Another important research example on this theme is a study by Swann, Morris, and Blumberg (1996). In this study, college students who were either sexually active or virgins were shown a film about the dangers of AIDS. Following this, the accessibility of thoughts of AIDS was assessed by means of a Stroop color-word task performed under conditions of cognitive load (cf. Wegner & Erber, 1992). These researchers observed that whereas the film had little influence on accessibility for the audience of virgins, it dramatically enhanced accessibility of thoughts of AIDS for those viewers who were sexually active. Although consciousness of the thought was not specifically assessed in this study, the implication of this result is that exposure to something one does not want to think about induces the state of deep cognitive activation.

When the mind is considered as a two-tiered system in this way, it is possible to appreciate a variety of possible states. There may be deep activation of one thought and surface activation of another, for example, as well as interesting dynamics involving transitions between states. The precise balance of activation—from full, to surface, to deep, and back to full—is likely to be influenced during mental control by the person's continued interest in achieving mental control, by the distracters the person encounters along the way, and of course by the person's perceptual input and habitual activation patterns as well. The dynamics of cognitive activation are likely to be complex indeed, given these multiple sources of input. However, it is probably the case that the stable state of deep cognitive activation occurs primarily when people try to control their minds.

### Consequences of Deep Activation

Deep cognitive activation is worth distinguishing from other mental states because it has unique effects on thought, emotion, and behavior. Moreover, even when these effects are induced experimentally, they appear to cause experiences like those had by individuals suffering certain varieties of psychopathology. For this reason, it is worth examining what has been learned from experiments in which deep cognitive activation is induced. In these studies, the state is created in experimental participants through a method usually involving one or more of the afore-

mentioned sources of activation. The effects of such manipulations can be sorted into the categories of *conscious intrusion*, *emotion intensification*, *direct and indirect effects on behavior and judgment*, and the *renewal of mental control*. In what follows, we examine evidence concerning each of these consequences.

### Conscious Intrusion

The signal characteristic of deep cognitive activation is its tendency to prompt the intrusive occurrence of the activated thought in consciousness. A benign yet familiar example of this is the occurrence of the "aha" experience (or in some cases, the "wahoo" experience) that comes when a creative insight pops into mind. It is tempting to argue that the rudiments of this insight are present in mind in some nonconscious sense prior to the insight. This combination of accessibility and lack of consciousness corresponds to deep activation, and this is suddenly transformed into full activation when the conscious intrusion happens. Ingenious research by Bowers, Regehr, Balzhazard, and Parker (1990) has documented this progression by producing accessibility experimentally. Participants were asked to solve word or object identification problems by making successive guesses, and were given feedback about each guess. Their guesses were found to begin converging associatively on the right answer many trials in advance of the conscious intrusion of the solution in mind. Apparently, a form of early accessibility of the solution occurs in such a task, and in the moments before the answer pops to mind the state of deep cognitive activation may become profound indeed. In a sense, the intrusion of the answer yields a kind of relief, a sudden release from the state of deep activation.

Such relief is not so apparent when deep activation is hiding some vulgar surprise. When the individual has been suppressing an unwanted thought, for example, the intrusion of that thought can be almost brutal in its sudden return to consciousness (Trinder & Salkovskis, 1994; Wegner et al., 1987). The thought's return can be frightening, but it is not foreign in the sense that it is unfamiliar or obscure. Rather, the intrusion is hauntingly familiar, an abrupt reminder of what was hidden in deep activation—of what was there all along, in much the same sense that a creative insight is subtly present just before it pops into consciousness. This feeling of familiarity is often the result not just of the accessibility of the thought, but also of a history of having suppressed the thought previously. The cyclic alternation of intrusion followed by suppression, followed by intrusion, and so on, is a common format for the expression of the instability of deep activation (Horowitz, 1976; Lane & Wegner, 1995).

The intrusions of deeply activated thoughts into consciousness may lead to an overvaluation of the thoughts. It does seem that a thought popping to mind is experienced as somehow more genuine, important, or reflective of one's inner self than a thought that one entertains on purpose. The finding that people become attracted to those with whom they share secret relationships illustrates this possibility, as this often occurs by virtue of the suppression of thoughts about the relationship that happens in service of keeping the secret (Lane & Wegner, 1995; Wegner, Lane, & Dimitri, 1994). People become preoccupied with their secret partner and interpret this as attraction. Similar

processes might underlie the development of bizarre or dangerous preoccupations of many kinds, for the reason that the intrusion of a thought imbues that thought with special significance. By this pathway, people who intrusively think of suicide, for example, may find the impulse more attractive than it should be, and people who intrusively think of fears of death or illness, in turn, may find the image of such fates to be more compelling than they would be were they thinking about them on purpose.

### *Emotion Intensification*

The magnification of intrusion through deep cognitive activation blends directly over into a parallel influence on emotion. The deep activation of emotion-relevant thoughts appears to induce experience of the associated emotion, and this can be measured psychophysiological. When deep activation of an emotional thought is produced through subliminal perceptual input, for instance, it appears that skin conductance level (SCL) increases despite the absence of this thought in consciousness (Corteen & Wood, 1972; Masling, Bornstein, Poynton, Reed, & Katkin, 1991). It is always a concern in this research whether the accessible items have crept into consciousness along the way, of course, and for this reason it is instructive to look also at research in which people are specifically trying to clear consciousness of emotional thoughts and in which measures of such conscious returns are possible.

In a series of studies by Wegner, Shortt, Blake, and Page (1990), participants were instructed not to think about sex. The main finding was that people so instructed showed increased SCL, comparable to that of people who were instructed to think consciously about sex. Of course, the suppression groups exhibited frequent intrusions in their think-aloud protocols, so it cannot be claimed that deep activation was operative during all of this emotional reaction. However, it was also found that the frequency of intrusions each minute during suppression was correlated over time with participants' SCL across a 30-min session. This correlation was not observed for participants who were actively thinking about sex, suggesting that the transition from deep to full activation—the popping of the emotional thought into consciousness—may be especially linked with this electrodermal measure of emotion. (Such correlations were also not found for participants suppressing or thinking about non-emotional topics, so it is not that case that deep cognitive activation carves emotion out of nothing.)

The notion that emotional responding may be heightened by deep activation follows from further evidence uncovered by Wegner and Gold (1995). In two studies, they examined SCL and think-aloud protocols among participants who had just finished suppressing the thought of an old flame (i.e., a past close relationship). Those participants who were not particularly unhappy about the loss of their partner showed little emotion at this time, even when they were encouraged to think about the person. The participants who were especially attached to their partner and who still regretted the loss, in turn, spoke very little about the old flame when they were encouraged to do so following the suppression task. However, at this time they exhibited increased SCL. One way to understand these findings is to say that the suppression of an emotional thought created a disinhibition of the emotion in the period following—a disin-

hibition so upsetting that participants elected to continue trying to erase the thought from consciousness. And it was during this period of self-induced deep activation that enhanced electrodermal evidence of an emotional response was found.

There may also be emotional reactions that do not surface psychophysiological, but that nevertheless influence the associative pathways whereby new thoughts become accessible. Sadness and depression may not influence the sympathetic nervous system very markedly, for example, but during deep activation they could yield widespread emotional effects. It is clear that depression heightens the accessibility of sad thoughts (Gotlib & McCann, 1984), and that it can increase the occurrence of dysfunctional thoughts. The desire not to be sad, in turn, can yield deep activation of sad thoughts and, with the addition of mental load, can cause sad mood (Wegner et al., 1993). The deep activation of sad thoughts may be a necessary part of the reporting of dysfunctional beliefs that, when activated by life events, may cause depressive symptoms (cf. Persons & Miranda, 1995).

It may also be that compelling the person to think consciously about the emotional topic that has been deeply activated has the effect of reducing emotional response. For instance, there is evidence that the introduction of an emotional state to consciousness can undermine deep activation in the laboratory. Matthews and Sebastian (1993) found that when a fear-arousing stimulus (a snake for snake phobics) was presented to participants, the level of accessibility of snake thoughts in a Stroop interference task was reduced. The more general notion that exposure to anxiety-producing stimuli yields habituation and reduced emotional responding (e.g., Zinbarg, Barlow, Brown, & Hertz, 1992) may be traced, perhaps, to the tendency for exposure to push people out of the state of deep cognitive activation. The reduction in emotional sensitivity that follows from disclosure of emotional events (Pennebaker, 1990) might also be traced to the movement from deep to full activation—and perhaps from there to no activation at all.

### *Direct Behavior Effects*

When thoughts about a behavior are deeply activated, the behavior can occur as a result. This effect has been observed when people are unconsciously primed to think about a behavior and then are presented with a situation in which the behavior might be appropriate. Carver, Ganellen, Froming, and Chambers (1983) found that people who were subliminally primed with the concept of hostility became more aggressive toward others later on in the experiment. Bargh et al. (1996) observed people who were primed with thoughts of aging, in turn, and found that they walked more slowly than others as they left the experiment. There appears to be a variety of direct behavioral effects that result from the deep cognitive activation of ideas of behavior.

These effects arise just as readily when the state of deep activation is created through mental control. When people try not to think about a behavior, they typically produce that very behavior, especially when they are under conditions of mental or physical load. Wegner, Ansfield, and Pilloff (1997) found, for instance, that people who are instructed not to overshoot a golf putt become inclined to do so. Presumably, the person in

this instance is actively avoiding thoughts of overshooting, and so increases the ironic accessibility of these thoughts even while avoiding their conscious presence. This research also found that people who are trying not to move a hand-held pendulum in a particular direction become likely to do so, and that this effect is accentuated when a cognitive load is imposed.

These direct behavioral effects of deep activation may be what people are trying to overcome when they try to avoid unwanted impulses by stopping thoughts about them or by engaging in preventive avoidance of behavior-relevant situations. The person who fears turning the steering wheel into traffic, for example, may be onto something—in that this impulse could well be enacted given deep activation at the right moment. However, the strategy of using thought suppression as a preventive technique in such cases is uniquely inappropriate. It is suppression, after all, that is causing the deep activation in the first place. Individuals who develop obsessions or compulsions aimed at preventing the occurrence of feared behaviors may paradoxically be increasing the likelihood of such behaviors by maintaining their deep activation.

### *Indirect Behavior and Judgment Effects*

The overt manifestations of deep cognitive activation are sometimes indirect, linked in a nonobvious way to the activated thought. Luria (1924–1929) offered a provocative early experimental observation of what appears to be such an indirect behavioral effect of deep activation. He hypnotized a woman and had her imagine a situation in which she beat a 6-year-old boy with a stick. She was uncomfortable with this image even in hypnosis, but then Luria suggested that she no longer remember it when the hypnotic session was over. Later on, she evidenced the suggested posthypnotic amnesia, both to direct questioning and in a series of word associations. She then had movement sensors attached to both hands, and was asked to make a movement only with her right hand at the moment of each word association response. What Luria observed was that on questions relevant to the beating, her left hand showed an associated tremor, a movement of which the participant was unconscious, but that appeared only on relevant items.

It is a matter of considerable controversy and continued research whether hypnosis indeed yields deep cognitive activation of the sort we have defined here. It does appear that hypnotic amnesia can prompt the unreportability of conscious presence of a thought, as suggested by our definition of deep activation, but it is not clear whether the format of the unconscious activation of a thought is the same in hypnosis as it is in waking states. Bowers and Woody (1996) have found that instructions to suppress thoughts delivered to hypnotized participants created little evidence of intrusive rebound of such thoughts. This may mean that hypnosis creates a more stable form of deep activation than those observed in un hypnotized people, or it may indicate that hypnosis heightens the ability or motivation of individuals to avoid reporting even the intrusion of suppressed thoughts. Further hypnosis research is necessary with measures of deep activation that are less open to the participant's strategic control.

In the recent literature on the effects of thought suppression, there are other indications that deep cognitive activation yields indirect effects. These effects are often reminiscent of what

might be predicted from a psychoanalytic standpoint, but they follow from a more straightforward line of cognitive reasoning. Newman, Duff, and Baumeister (1997), for example, found that when people are asked to suppress thoughts of a personal characteristic while they are under mental load, they subsequently develop an increased tendency to perceive that characteristic in others. This mirrors the notion of defensive projection, but Newman et al. found that the effect occurs because of the operation of deep cognitive activation. Specifically, participants in this situation experience increased accessibility of thoughts of the personal characteristic, and this readiness makes them more inclined to perceive it anywhere—including in other people. It makes sense that people might naturally suppress thoughts of their own personal characteristics when they find these objectionable, and so develop the inclination toward projection that was observed through instructed suppression in this research.

Similar indirect effects appear when people keep secrets about themselves. Smart and Wegner (1996) examined the cognitive outcomes of possessing a concealed stigma in social interaction. For this experiment, undergraduate women who either had an eating disorder or not played the role of someone with or without an eating disorder while being interviewed. The interview began with several neutral questions and then progressively became more relevant to eating disorders. Participants who did have an eating disorder and were playing the role of someone who did not reported intrusive thoughts about their disorder and projected the disorder onto the experimenter more than did those who had the disorder and were playing the role that was consistent with it. In another study with the same design, Smart and Wegner (1997) found that the accessibility of obesity-relevant thoughts (e.g., fat, flabby thighs) assessed by a Stroop color-word task immediately following the interview was highest among participants who really had eating disorders but were playing the role of not having one.

The "stereotype threat" felt by Black students taking intellectual tests (Steele & Aronson, 1995) suggests yet another example of an indirect behavioral effect of deep activation. Steele and Aronson (1995) have provided evidence indicating that Black students do poorly on intellectual tests as a result of the accessibility of thoughts about their stereotypically low intellectual ability. These researchers told Black and White undergraduates that tests they were about to take either were diagnostic of intellectual ability or not. Black participants' performance was uniquely hampered by this instruction. In one study (Steele & Aronson, 1995, Experiment 3), in addition, the participants' accessibility of racial stereotypes and ability-related self-doubts was measured by having them perform a word-fragment completion task. Some of these fragments had a word reflecting either a race-related construct or an image associated with African Americans as one plausible solution (e.g., L A \_ \_ to prompt LAZY), and others featured self-doubts about competence and ability (e.g., D U \_ \_ to prompt DUMB).

The study revealed that Black participants expecting to take a challenging intellectual test showed significantly greater cognitive activation of stereotypes about Blacks and greater cognitive activation of ability self-doubts than did Black participants in the nondiagnostic condition or White participants in either condition. The implication here is that when the Black participants focus on the diagnosticity of the tests that they were

expecting to take, they experience a sense of stereotype threat (a self-evaluative threat that they will confirm stereotypes about their racial group) which results in their racial stereotypes and ability concerns becoming deeply activated. This in turn undermines their actual test performance. This interpretation of these research results suggests that it might be interesting and useful to learn what would happen if racial concerns were made explicit and so were introduced to consciousness.

Indirect expressions of deep activation have been particularly clear and suggestive in research on the consequences of thinking about one's own death. In the aforementioned studies by Arndt et al. (1997), for example, the influence of thoughts of death was examined not only by measures of accessibility, but also by measures of "worldview defense," the tendency to become patriotic and culture-conforming as a symbolic means of preserving the basis of one's self-worth (Solomon, Greenberg, & Pyszczynski, 1991). These studies suggested that when death was made salient, deep cognitive activation of the thought of death became likely, particularly when mental loads prompted the ironic accessibility of death thoughts that were being suppressed from conscious presence. The unconscious accessibility of these thoughts, in turn, was found to prompt the occurrence of worldview defense, and to decrease in turn after the worldview defense had been given an opportunity to occur. This effect did not appear to be affectively mediated, by the way, as measurements of self-reported affect did not show any correlation with the various other measurements.

These several examples of indirect expressions of deep cognitive activation suggest that this state has subtle yet far-reaching effects on other processes. In some sense, this is understandable given the blocked potentiation of behavior and thought that is inherent in deep activation. Quite simply, here we have a state of mind that is demonstrably set to change. A thought is poised to enter consciousness, and yet for some motivated or situational reason, is not allowed to be there. When this happens, it makes sense that associative pathways could be activated beneath consciousness, ones that lead to the expression of the accessible thought in other ways. These indirect eruptions of deep activation into thought or behavior would seem to be particularly likely to occur in areas that are not so obviously related to the thought that they generate conscious monitoring. Deep activation may produce effects that are just far enough away from the thought to allow the state of deep activation to continue unperturbed.

### *Renewal of Mental Control and the Perpetuation of Deep Activation*

The idea that deep activation somehow perpetuates itself has come up implicitly at various points in our discussion, and it is time to consider this possibility explicitly. The risk here, of course, is following the psychoanalytic path of creating a theoretical homunculus, an active mental agent, in our attempt to understand the workings of this mental state. The reason this is tempting is that deep cognitive activation appears to operate in some ways like a self-perpetuating entity, a state of mind bent on maintaining itself indefinitely. This property is particularly surprising in light of the precariousness and instability we have

attributed to the state at several points in the discussion thus far.

How is deep cognitive activation maintained despite its unstable nature? In many cases, it is not maintained. When happy thoughts are deeply activated, for example, there is usually little tendency to perpetuate the state. A creative insight, for example, or a memory that one hopes to retrieve, is not prone to yield intrusions or emotions that will prompt the person to reinstate suppression or avoidance. The thought is welcomed to consciousness and full activation is produced. It is probably the case that deep cognitive activation is maintained primarily when the person achieves conscious glimpses of some thought that is too painful or unfathomable to allow in consciousness. That is, there may well need to be at least one undesired intrusion every once in a while to motivate continued mental control and so promote the maintenance of deep cognitive activation.

We know from the studies by Wegner and Gold (1995) mentioned earlier that deep activation of emotional thoughts can be particularly sticky in this regard. When participants followed the instruction to suppress the thought of a still-desired old flame in this research, and then later were invited to think and talk about this person, their SCL spiked, indicating sympathetic arousal—but at the same time, they did not exhibit conscious focus on this person in their think-aloud protocols. Apparently, their initial foray into deep activation was enough to create a continued suppression process, an avoidance of conscious thoughts of the old flame even while their SCL increments indicated unconscious accessibility of the topic. Just as the mention of an unwanted thought can cause an immediate suppression, and so lead to deep activation (Arndt et al., 1997; Swann et al., 1996), the return of such thoughts can restore deep activation as well. It is not clear when such suppression occurs that people are fully aware of doing it, even though suppression is commonly viewed as a conscious process, and research is needed to determine whether suppression continues to be conscious when it has successfully produced a state of deep activation.

The tendency of deep activation to perpetuate itself may be why, when Kelly and Kahn (1994) asked people to suppress their personally relevant intrusive thoughts, the people were able to do so. Participants did not show the rebound of thoughts after suppression that has been found for thoughts of white bears (Wegner et al., 1987). When a "problem thought" intrudes following a period of instructed suppression, it makes sense that one might just intensify one's suppression attempts, no matter what the experimenter says about going ahead and thinking about it now. So, no rebound effect occurs, at least when this is measured through think-aloud procedures. Think-aloud measures only tap conscious presence, of course, and may be insensitive to deep activation. Measures of accessibility taken during such a period might well show continued deep activation, but this experiment has not yet been done.

The conclusions to be reached from these studies of the consequences of deep activation are several. Although research in this area is ongoing, we know enough to say that deep activation is a state of mind that yields intrusive thinking, intensified emotion, and a variety of direct and indirect effects on behavior. The key observation, however, is that despite the apparent volatility of deep activation, it can be quite stable when the person is motivated to dispel a thought or emotion from consciousness in the

long term. The consequences of deep activation then can be chronic, and they resemble symptoms arising from anxiety, depression, obsessive-compulsive or self-control difficulties, and other disorders that are accompanied by significant desires to engage in mental control (cf. Wegner, 1997a).

### Deep Activation, Psychopathology, and Psychotherapy

A thought in consciousness defines the phenomenal present for the person. It is those thoughts that are still coming, the ones that are surging toward the front, that are the person's future. The curious feature of deep cognitive activation, as we have defined it here, is that it involves a frozen moment, one in which the future fails to become the present. For a thought to be deeply activated, it must have measurable implications for the person's continuing thought and activity, and all the while must not fulfill this potential and arise in consciousness.

It is not clear that all thoughts caught in this particular limbo indeed share similar influences on the person's subsequent psychology. We have noted the general partition between thoughts that are unwanted and those that are wanted, for instance, noting that it is the unwanted ones that will probably be held in deep activation most frequently and profoundly. To take this a step further, it is possible to suggest that there are thoughts that are "naturals" for deep activation, ones that people don't want to be conscious of nearly as often as the thoughts are activated, and that therefore tend to persist in this state. These are the abhorrent thoughts. When people report thinking of things that are perfectly awful, of things that others would never want to hear, of things that suggest their owners are dangerous or despicable, or of things that scare them silly, their conscious reports become exceptions to the normal flow of consciousness, brief intrusions of something that spends most of its time in deep activation.

This, then, is the basic connection between deep activation and psychopathology. Deep activation of a thought typically may begin for any number of reasons. But once it is in that position, its transition to full activation can be frightening, emotional, intrusive, and even vile. If the thought has enough emotional impact to begin with, deep activation acts to magnify that impact tremendously and so perpetuate attempted mental control—and continued deep activation. This makes sense as a way of understanding the maintenance of obsessions and compulsions, and the maintenance of the behavioral avoidance that appears to go hand-in-hand with continued deep activation (Trinder & Salkovskis, 1994; Wegner, 1988; Wegner & Zanakos, 1994). It may also provide a way of understanding the maintenance of anxiety disorders (de Ruiter & Brosschot, 1994; Wegner, Broome, & Blumberg, 1997), insomnia (Ansfield, Wegner, & Bowser, 1996), and depression (Wegner & Zanakos, 1994; Wenzlaff, Wegner, & Roper, 1988).

The voluntary suppression of unwanted thoughts appears to be a general marker for psychopathology, suggesting that deep cognitive activation may characterize a variety of disorders. Wegner and Zanakos (1994) tested this possibility with a measure of chronic thought suppression, the White Bear Suppression Inventory (WBSI), that taps self-reported attempts to suppress thoughts (e.g., "There are things that I try not to think about"). This measure was constructed through factor analytic

procedures in a college population, and has high levels of internal consistency and temporal stability in this group. The measure turns out to be substantially correlated with self-report measures of depression and anxiety in this population, as well as with self-report and interview measures of obsessive-compulsive disorder symptoms. Aaron (1997) reported that WBSI scores were predictive of posttraumatic stress disorder symptoms in children following acute physical injury, and van den Hout, Merckelbach, and Pool (1996) found a substantial correlation of WBSI thought suppression with self-reports of dissociative experiences. When thought suppression accompanies psychological disorders, it may exacerbate them and magnify their symptoms.

This broad possibility suggests that one useful goal of psychotherapy may be the elimination of chronic deep activation. In a way, this notion parallels the psychoanalytic idea that a goal for therapy is the achievement of insight that comes when material from the unconscious is brought into consciousness. However, the elimination of the chronic deep activation of a thought is unlikely to occur in a flash of insight, and would seem instead to require considerable time and work. Because deep activation is likely to be supported and maintained by the client's motives (to avoid consciousness of the thought) and strategies (of suppression and other forms of mental control), approaches that simply turn deep activation into full activation may be met with extreme resistance.

Eliminating chronic deep activation is also not to be confused as a therapeutic goal with catharsis or other forms of emotional expression. It is certainly true that bringing deeply activated emotional thoughts into full activation can cause profound emotion. But it is not necessarily the production of that emotion that achieves a therapeutic effect. Instead, the simple remission of the desire to clear consciousness of the thought is what is important, and forms of expression or disclosure that promote such remission are likely to be therapeutic as a side effect. The notion that therapy for fear must necessarily make the feared information available to consciousness (Foa & Kozak, 1986), for example, is consistent with the present approach primarily in suggesting that something must be done to overcome the client's desire to keep such information out of conscious presence. By this reasoning, the active ingredient of exposure therapy is less the confrontation of the information that has been avoided and pushed into deep activation than it is the reduction of the desire to continue such avoidance.

There is substantial evidence that exposure techniques do reduce deep activation. The most direct demonstrations have tested the effectiveness of exposure to phobic objects and thoughts on the subsequent accessibility of those thoughts in the Stroop interference paradigm—the "Emotional Stroop" task (Logan & Goetsch, 1993; Mathews & MacLeod, 1985; Williams, Mathews, & MacLeod, 1996). Watts, McKenna, Sharrock, and Trezise (1986) had people with spider phobia spend 6 weeks in group desensitization therapy being exposed to various sorts of spider stimuli. They found that as the phobics became less fearful of spiders over the course of treatment, their color-naming interference for spider stimuli on an Emotional Stroop task was dramatically reduced. In a similar study, Lavy, van den Hout, and Arntz (1993) found a reduction in Stroop interference effects for people with spider phobias following exposure treat-

ment that lasted only 2.5 hours. They also observed a significant correlation between the amount of reduction in interference and the improvement in a phobic avoidance behavioral measure.

People with social phobias also experience reduced deep activation as a result of exposure to their fears. Mattia, Heimberg, and Hope (1993) studied patients with social phobias undergoing either a 12-week group cognitive behavioral program or phenelzine treatment. Those who responded to either treatment showed a reduction in the amount of color-naming interference shown on social threat words in the Emotional Stroop task, whereas nonresponders showed an increased interference on these words. There is also evidence that those suffering from anxiety respond to an awareness of their thoughts. Mathews, Mogg, Kentish, and Eysenck (1995) examined patients with anxiety undergoing group anxiety management training. Patients were tested while in the episode and again when recovered using parallel forms of the Emotional Stroop task. They found that the initial difference between patients and controls in the degree of Stroop interference was gone by the end of the treatment 17 weeks later.

As a final note on therapy, we can point to certain kinds of paradoxical therapies that appear to target deep activation quite directly. When clients are advised to create their symptoms, or are otherwise encouraged to rescind or reverse their habitual mental control activities, a reduction in deep activation would seem to be a logical consequence. Although research has not established this directly, there is some evidence for the effectiveness of paradoxical techniques in cases when clients' symptoms appear to be produced by mental control attempts gone awry (e.g., Shoham & Rohrbaugh, 1997; Shoham-Salomon & Rosenthal, 1987). These findings suggest that some forms of psychopathology may be responsive to treatments that have the curious theme of encouraging people to stop treating themselves.

### Conclusion

Deep cognitive activation describes a common state of mind, one that doubtless occurs many times daily for everyone. The rich array of automatic processes underlying and supporting our conscious mental lives guarantees that we will often be influenced by accessible thoughts without having those thoughts consciously present. As it happens, though, this cognitive state can be far more mischievous than others, especially when it becomes chronic, and can yield symptoms ranging from intrusive thoughts and emotional upsets to behaviors that express the deeply activated thoughts, either directly or indirectly. These consequences of deep activation, as well as the implications of this state for psychopathology and psychotherapy, echo in some ways a long history of psychoanalytic thinking about the unconscious. But deep activation represents a new and, most notably, measurable way of conceptualizing unconscious influences. These influences, as we have seen, appear to be generated primarily when people try to control their minds, and can be alleviated by techniques that urge them to discontinue such control.

The basis for the study of deep activation differs from that of much of current cognitive clinical psychology, and this work suggests a new orientation toward these old problems. On a theoretical level, this idea arises from a unified explanatory system—ironic process theory—and so suggests a vehicle with

an unusual potential for broad and integrative application to psychopathology. The study of deep activation also departs from current cognitive clinical psychology in its emphasis on two methods that are used all too infrequently in this field. The usual method, involving the questioning of people who have been identified as suffering from psychopathology, can be supplemented by (a) the experimental manipulation of mental states and mental control intentions through instruction, and (b) the measurement of unconscious accessibility in addition to the usual measurement of consciously reportable thoughts and mental states. Much can be learned when it is recognized that people can be encouraged to control their minds in the laboratory or clinic, much as they would on their own, and the deep cognitive effects of this control can be assessed through contemporary methods.

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