

## AMNESIA, FUNCTIONAL

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Analyses of learning and memory increasingly attempt to take account of clinical and experimental research on individuals with amnesia. Most of this literature has focused on pathologies of memory associated with demonstrable brain lesions (e.g., the amnesic syndrome; see AMNESIA, ORGANIC) or the administration of centrally acting drugs (e.g., barbiturates, benzodiazepines, and anesthetics), a research strategy that affords information about the biological substrates of certain cognitive functions. However, other sorts of disorders have also been of interest. The term *functional amnesia* refers to a collection of memory disorders attributable to instigating processes that do not result in damage or injury to the brain but produce more FORGETTING than would normally occur in the absence of those instigating processes.

### The Pathological Amnesias

One major category of functional amnesia occurs within the context of diagnosable psychopathology, especially the dramatic "dissociative disorders" listed in the *Diagnostic Statistical Manual*, third edition, revised (DSM-III-R) of the American Psychiatric Association (1987). In current diagnostic nosology, this category includes a wide variety of syndromes whose common core is an alteration in consciousness affecting memory and identity. The classic forms are psychogenic amnesia and fugue, multiple personality disorder, and depersonalization and derealization.

In *psychogenic amnesia* (also known as limited amnesia), the patient suffers a loss of autobiographical memory for certain past experiences. It is frequently observed in cases of violent crime (interestingly, it can affect either victims or perpetrators), war neurosis, and other types of post-traumatic stress disorder.

In *psychogenic fugue* (also known as functional retrograde amnesia), the amnesia is much more extensive, covering the whole of the individual's past life, and is commonly coupled with a loss of personal identity—and, often, physical relocation. The classic instance is Ansel Bourne, studied by William JAMES in the nineteenth century. The onset of the fugue is typically associated with a physical or mental trauma; if the loss of memory and identity

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See Alzheimer's Disease; Amnesia, Functional; Amnesia, Infantile; Amnesia, Organic; Amnesia, Transient Global; Head Injury; Material-Specific Memory Deficits; Rehabilitation of Memory Disorders

is accompanied by relocation, the condition may go unnoticed until the patient is asked a question about himself or herself that cannot be answered satisfactorily. In contrast with the retrograde amnesias associated with organic factors (e.g., electroconvulsive therapy or closed head wound), most fugues cover the patient's entire life history. Recovery typically begins with the patient's recognition of loss of identity. This is followed by the recovery of identity and memory *per se*, either spontaneously or in response to the appearance of a relative or other salient cue (sometimes abetted by hypnosis or sodium amytal). When the fugue is resolved, the patient is typically left with a limited amnesia covering the period of the fugue.

In *multiple personality*, a single individual appears to manifest two or more distinct identities that alternate in control over conscious experience, thought, and action. Before World War II, the typical case presented with only two or three such "ego states"; interestingly, more recent cases have tended to present more than this number. The classic case is "Eve," whose three personalities were studied by Corbett Thigpen and Hervey Cleckley in the 1950s. Although DSM-III-R does not require amnesia for this diagnosis, the personalities are commonly separated by some degree of amnesia. This amnesic barrier may be symmetrical, in which case each ego state is ignorant of the other(s); or, more commonly, asymmetrical, in which case an ego state may be aware of some of its counterparts but ignorant of others.

In *depersonalization* the person believes that he or she has changed in some way, or is somehow unreal; in *derealization* the same beliefs are held about one's surroundings. Because these beliefs are objectively inappropriate, these experiences can be construed as disorders of memory: The person fails to recognize some object, self, or situation with which he or she is objectively quite familiar. Episodes of depersonalization and derealization commonly occur in response to stress; they may also be induced by psychedelic drugs, and occur spontaneously in a substantial proportion of the normal population.

The dissociative disorders have been of interest at least since the time of Sigmund FREUD and Pierre Janet. Unfortunately, despite the publication of a number of dramatic clinical case narratives, these disorders rarely have been studied with controlled experimental procedures. For example, little is known about psychogenic amnesia beyond anecdotes. A few cases of fugue and multiple personality have been studied in the laboratory, but we have

no idea how representative they are. Nevertheless, the available evidence suggests a pattern of selective memory deficit that is in some respects similar to that observed in organic amnesia. Thus, psychogenic fugue impairs memory for past experiences and other aspects of self-knowledge, but leaves the patient's repertoire of procedural and semantic knowledge largely intact. Moreover, the deficits in EPISODIC MEMORY most commonly impair explicit memory (conscious recollection of the past) but leave IMPLICIT MEMORY (unintentional use of knowledge gained through past experiences) relatively spared. However, it should be noted that most case studies of fugue and multiple personality have not been done with a formal taxonomy of memory structures and processes in mind, and thus have not provided a thorough survey of learning and memory functions.

### The Nonpathological Amnesias

In other forms of functional amnesia, dramatic forgetting occurs in the ordinary course of everyday living. For example, people commonly fail to remember their dreams and other events of the night's sleep (e.g., episodes of brief awakening, sleepwalking, or sleeptalking, or noises in the ambient environment). In addition, attempts to demonstrate sleep learning have been almost uniformly unsuccessful. Theoretical accounts of this memory deficit usually revolve around encoding factors. For example, it has been hypothesized that sleep inhibits the higher cortical centers that support perceptual processing. However, a strong view of cortical inactivity during sleep is not supported by psychophysiological evidence such as evoked potentials. More likely, the answer lies in the sleeper's failure to engage in strategic, attention-consuming activities that support the encoding of retrievable memories. On the retrieval side, the possibility has been raised that memory for sleep events is state-dependent, a hypothesis that will prove difficult to test.

Another example of nonpathological functional amnesia concerns memory for infancy and childhood. People rarely remember much of their lives before age 5 or so; the earliest memory is typically dated between the third and fourth birthdays, and memory does not become continuous until after about age 7. As with sleep, most theoretical accounts of this developmental amnesia focus on encoding factors. For example, infantile amnesia

(covering the first 2 years of life) may reflect the child's relative inability to encode symbolic, and especially linguistic, representations of events; even older children lack the information-processing capacity to encode retrievable memories. Other investigators, influenced by Piagetian theory, have suggested that memories encoded by "pre-operational" schemata may be inaccessible to retrieval by the more elaborate schemata characteristic of adult thought. A third, "ecological" viewpoint suggests that the environment does not offer the young child support in encoding distinctive episodic memory traces. However, aside from studies of infantile amnesia in rats, whose results implicate encoding processes, perhaps the most interesting aspect of infantile and childhood amnesia is how seldom any of these hypotheses have been subject to empirical test. (See also AMNESIA, INFANTILE.)

In addition to these universal instances of functional amnesia, a dramatic form of forgetting may be induced in a minority of the population by means of hypnosis. Posthypnotic amnesia rarely occurs in the absence of specific suggestions, a fact that distinguishes posthypnotic amnesia from state-dependent memory. And the amnesia can be reversed by administration of a prearranged reversibility cue, indicating that the amnesia affects retrieval, not encoding, processes. In some ways, posthypnotic amnesia resembles the memory disorders observed in psychogenic amnesia, fugue, and multiple personality. Thus, it affects memory for events the subject experienced while hypnotized, but not procedural or context-free declarative knowledge acquired during hypnosis. More important, posthypnotic amnesia impairs explicit, but spares implicit, expressions of episodic memory: Priming, interference, and savings in relearning are all unaffected by amnesia suggestions. Finally, as with the pathological syndromes, theoretical interpretation of posthypnotic amnesia is made difficult by the fact that the impairment of memory is suggested, not spontaneous, and is affected by such interpersonal factors as the subject's beliefs and expectations, relationship with the hypnotist, and general sociocultural background. (See also HYPNOSIS AND MEMORY.)

### Repression and Dissociation

Historically, the absence of demonstrable brain damage has led to theoretical accounts of the func-

tional amnesias that remain on a purely psychological level of explanation. Since the nineteenth century, two competing mechanisms have been offered: repression and dissociation. Repression, as defined by Freud, is the motivated forgetting of material (typically relating to sexual or aggressive ideas and impulses) that conflicts with physical reality or social sanctions. Dissociation, as discussed by Janet and by Morton Prince, is a "splitting off" from awareness of a set of percepts, memories, thoughts, or feelings, so that they are inaccessible to conscious perception and recollection. Although dissociation may occur in response to stress, and affect anxiety-laden percepts and memories, neither condition is a necessary precondition. Moreover, while Freud argued that repressed contents could be known only by inference (because they were expressed only symbolically), Janet argued that dissociated contents could be recovered directly.

For a long time, repression was favored over dissociation, as part of the general dominance of Freudian psychoanalysis within psychopathology and psychotherapy. More recently, however, the concept of dissociation as a psychological mechanism has been revived by Ernest Hilgard and others, as indicated by the label "dissociative disorders" given to the pathological forms of functional amnesia listed in DSM-III-R.

It should be recognized that the term *functional* has a certain ambiguity about it. Obviously, the functional amnesias, as mental states, are accompanied by correlated changes in brain state—although these physiological changes cannot be said to "cause" the amnesia in the same sense that hippocampal damage does. With respect to some of the syndromes described here, it seems likely that advances in psychobiology will pinpoint such causal relationships. For example, infantile amnesia (in rats, at least) has been attributed to incomplete myelination of neural tissue, hippocampal development, and cortical maturation. And, arguably, the amnesia observed upon awakening is attributable to the profound brain changes that occur during sleep. For other functional disorders of memory, such as those associated with psychogenic amnesia, fugue, multiple personality, and hypnosis, it may be that future research will pinpoint similar brain changes that underlie these phenomena. Thus, just as general paresis was classified as a functional disorder for more than 400 years until the discovery of the syphilis spirochete, so it may be that future editions of this encyclopedia will find "functional amnesia" to be an empty category.

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