

Instructed Forgetting: Hypnotic and Nonhypnotic

John F. Kihlstrom
University of Wisconsin

In a commentary on an article by Geiselman, Bjork, and Fishman (1983), directed forgetting observed in the normal waking state is compared with amnesia as induced by hypnotic suggestion. The two paradigms typically differ with respect to the role of incidental or intentional learning, the amount of study devoted to the items, the temporal location of the cue to forget, the retention interval involved, and the measure of memory that is of interest. Depending on the directed-forgetting paradigm used, they also differ with respect to the actual inaccessibility of the to-be-forgotten items, the reversibility of the forgetting, and the extent of interference of the items targeted by the forget cue on other items. However, these comparisons are vitiated somewhat by the methodological differences between the two paradigms. Theoretically, the three mechanisms typically used to account for directed forgetting—selective rehearsal, list segregation, and selective search—do not appear to account for the amnesia observed in hypnosis. However, the two phenomena do appear to share a fourth mechanism, retrieval inhibition. Final acceptance of this conclusion, however, awaits comparison of the two types of instructed forgetting within a common experimental paradigm.

One topic that unites the basic and applied interests within contemporary cognitive psychology is the search for methods by which we can gain some measure of voluntary control over memory functioning. Most of this effort has gone into work on intentional *remembering*, with an emphasis on mnemonic techniques and other strategic processes in encoding and retrieval—incidental versus intentional learning, elaborative versus maintenance rehearsal, and the like (for reviews, see Crowder, 1976). It has taken longer for investigators to develop an interest in intentional *forgetting*, a phenomenon that intrigued the field in the late 1960s and early 1970s (for reviews, see Bjork, 1972, 1976; Epstein, 1972). Clearly, intentional forgetting is an essential component of a memory sys-

tem, preventing the mind from being cluttered by outdated and useless knowledge. The mechanisms underlying the intentional forgetting phenomenon seemed to be well understood by the mid-1970s,* which may be one reason why experimental interest in the phenomenon faded considerably thereafter. However, a nagging feeling persisted that something had been left out. Geiselman, Bjork, and Fishman (1983) have provided a valuable service both in reminding their colleagues of this phenomenon and in making a contribution to the search for the missing piece of the puzzle.

At the same time, it is extremely gratifying to find these investigators forging some links, however tentative, between intentional forgetting as observed in the normal waking state and the phenomenon of hypnotic amnesia (Coe, 1978; Cooper, 1979; Hilgard, 1966; Kihlstrom, 1977, 1978, 1982; Kihlstrom & Evans, 1979; Sarbin & Coe, 1979; Spanos, 1982; Spanos & Radtke-Bodorik, 1980). From time to time investigators of intentional forgetting and hypnotic amnesia have waved their hands in the direction of each other's phenomenon, but nobody has yet gotten around to a systematic comparison of them. At first glance, the two effects seem quite similar. In both cases a subject encodes

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Requests for reprints should be sent to John F. Kihlstrom, Department of Psychology, University of Wisconsin, W. J. Brogden Psychology Building, 1202 West Johnson Street, Madison, Wisconsin 53706.

some set of new information, receives an instruction to forget part or all of it, and then proceeds to do just that. In this article, I wish to consider the studies of hypnotic and non-hypnotic intentional forgetting more closely with respect to method, results, and theory, in order to see whether the similarities are more apparent than real.

Comparison of Methods

To begin with, it is useful to compare the methods that have been used in studies of hypnotic amnesia and intentional forgetting in the normal waking state. There are essentially two circumstances in which hypnotic amnesia is observed. One resembles an incidental learning situation, in which a subject takes part in a standardized hypnotic procedure consisting of a series of hypnotic suggestions, including the suggestion that he or she will be unable to remember the events and experiences that transpired during hypnosis until the experimenter administers a prearranged cue. This form of amnesia is very convenient to study and in fact has received a great deal of attention (Hilgard, 1965; Kihlstrom & Evans, 1979). However, the procedure is far from ideal because the suggested amnesia is confounded with other memorial processes related to momentary lapses of attention during hypnosis, contrast effects due to the success or failure of individual test suggestions, possible confusion over exactly what is to be remembered on the memory test, and the like. The other circumstance is that of intentional learning, in which a hypnotized subject studies a list of words or other material that is then covered by a suggestion for temporary amnesia. This technique permits rigorous experimental control over the conditions of encoding and degree of learning and clearer definition of what is required of the subject; it also articulates better with current theoretical accounts of remembering and forgetting, which for better or worse are based largely on the fate of memorized word lists. In some studies, the amnesia is tested during hypnosis. More commonly, amnesia is tested posthypnotically.

In directed forgetting, there also appear to be two main procedures, each of which allows for some variation (Bjork, 1972). Both, how-

ever, take place in the context of an intentional verbal learning situation, in which subjects are asked to study a list of words or similar material and retain them over a specified period of time. In the method of *cuing by item sets*, two sets of items are presented in blocked fashion, and the subject receives a cue directing him or her to forget one set but to remember the other. In the method of *item-by-item cuing*, the two sets of items are intermixed, and the subject is cued to forget or to remember each one in turn. In a comparison of the two methods, it appears that the procedures used in studies of hypnotic amnesia are closer to the method of cuing by item sets than the method of item-by-item cuing. Most experiments on amnesia, however, seem to involve a special case in which subjects are presented with only one set of items, that which is to be forgotten. Within the method of cuing by item sets, there appear to be three procedural variants (Bjork, 1972). In the method of *intraserial cuing*, the signal to forget occurs between the presentation of the set to be forgotten and the one to be remembered; in the method of *postinput cuing*, both sets are presented before the subject receives the cue; and in the method of *preinput cuing*, the subject is instructed which set he or she is to forget before the presentation of any items at all. No study of hypnotic amnesia has used intraserial cuing, as, for example, in a proactive inhibition paradigm. Only one study has used any form of preinput cuing. There the subjects were told before hypnosis that at the end of the session that they would receive a suggestion for posthypnotic amnesia. All the remaining research on hypnotic amnesia has involved some variant of postinput cuing.

Other procedural differences have to do with the study conditions and retention intervals involved. In directed forgetting the items are presented only once, with relatively brief study times and rapid interstimulus intervals, and retention is tested immediately. In the case of amnesia as it occurs on the standardized scales of hypnotic susceptibility, the items also occur only once. However, in this case the pacing is much more leisurely. The induction of hypnosis and administration of a dozen test suggestions can easily take upwards of an hour, but the memory test has

been delayed only as long as 3 min. after termination of hypnosis. In the amnesia studies that have used conventional verbal-learning procedures, especially those involving hypnotic, rather than posthypnotic amnesia, the timings more closely parallel those used in the directed-forgetting research. In these instances, the items are learned to a strict criterion of mastery before the suggestion is given. This is perhaps the most important difference between the two phenomena. Another important difference has to do with the measure of memory that is used. Both paradigms use measures of recall and recognition to determine whether the forgetting cue or amnesia suggestion has had its intended effect. Many studies of hypnotic and posthypnotic amnesia have also used measures of the organization of recall, but only a few have used measures of proactive or retroactive interference, or relearning. Before that of Geiselman et al. (1983), no study of directed forgetting had used organization indices, and the most common measure of memory appears to be some sort of interference. In the directed-forgetting literature the recall test appears to serve as something like a manipulation check, and interference appears to be the variable of substantial interest.

Perhaps then something should be said concerning the comparability of various measures of memory. Interference and savings in relearning are often preferred over recall and recognition on the grounds that they are more sensitive to what has been stored or because they are involuntary and thus less susceptible to distortion by criterion differences and other responses biases. This last consideration is important in the present case because both directed-forgetting and hypnotic amnesia paradigms include an explicit instruction to forget information that the subject has just acquired, raising the possibility that well-meaning subjects would simply comply with experimental demands and refrain from reporting items that they actually remember perfectly well. The general avoidance of savings and interference paradigms (except for Hull, 1933) within the hypnosis literature does not reflect the credulous investigator's naive trust in the subject's candor but rather an intuitive concern with the distinction between availability and accessi-

bility in memory (Tulving & Pearlstone, 1966). Given a failure of free recall, measures of cued recall, recognition, savings, and interference can indicate whether the critical material remains available in memory. Such comparisons are relevant to theoretical accounts of directed forgetting in terms of the role of encoding, storage, and retrieval processes, but this has never been an issue with respect to hypnotic amnesia (at least since Hull, 1933). Because the memories targeted by the amnesia suggestion can be recovered following administration of a prearranged reversibility cue, amnesia must be a phenomenon of retrieval. According to Hilgard's (1977) neodissociation theory of divided consciousness, the primary issue is whether the critical memories can be brought into phenomenal awareness and placed under voluntary control. The transfer paradigms simply cannot speak to this issue directly. Consider, for example, recent findings that subjects can show considerable savings in relearning even though they do not consciously remember the content of the original learning (Kollers, 1976; Nelson, 1978) and that previous experience can facilitate performance on a subsequent cognitive task even though they do not consciously remember what the earlier experience was (Jacoby & Dallas, 1981; Scarborough, Cortese, & Scarborough, 1977). The dissociation between the presence and activity of a memory on the one hand and the individual's awareness of that memory on the other also occurs in the cases of undoubtedly genuine amnesia due to organic brain syndrome (e.g., Jacoby, 1982; Moscovitch, 1982). Logically, then, such evidence cannot be used to impeach the testimony of amnesic subjects (or, for that matter, merely forgetful ones) that they cannot remember certain information (Kihlstrom, 1978). Given such a situation, other paradigms must be developed to reveal the mechanisms underlying amnesia and forgetting.

Comparison of Results

Investigators of both hypnotic amnesia and directed forgetting have been concerned with two types of effects: the retention of items covered by the forget cue, and the influence of the ostensibly forgotten items on

other items, which are to be remembered. These concerns form a second arena for comparison, but of course the methodological differences just outlined make any detailed comparison pointless. Pending direct comparison of hypnotic and nonhypnotic directed forgetting within the precisely the same paradigm, it seems best to confine discussion to some broad summary statements.

Among highly hypnotizable subjects, amnesia suggestions appear to result in a subjectively compelling disruption in memory retrieval; recall is especially affected, but recognition may also be poor. No amnesia occurs without a suggestion, explicit or implicit, thus differentiating posthypnotic amnesia from state-dependent retention. Despite the recall deficit, the critical memories continue actively to affect ongoing cognition and action. In a retroactive inhibition paradigm, for example, an interpolated list covered by amnesia continues to interfere with retrieval of the original list, and the items of a previously memorized word list facilitate the elicitation of list items on subsequent tasks involving the generation of word associations or category instances. Finally, when the experimenter administers the prearranged reversibility cue to cancel the amnesia suggestion, recall reverts to the high levels observed before the amnesia suggestion was given.

The effects of directed forgetting in the normal waking state appear to depend on the exact circumstances under which the forget cue is given. Intraserial cuing of item sets appears to produce an irreversible deficit in recall but has no effect on recognition of the to-be-forgotten items; there is, however, a dramatic reduction in interference on the to-be-remembered items. Postinput cuing of item sets occasionally reduces interference somewhat but apparently yields little or no recall deficit. In procedural terms, hypnotic amnesia is most similar to postinput cuing; in terms of outcome, however, the two procedures differ markedly with respect to the memorability of items which are to be forgotten. These critical items are temporarily inaccessible in hypnotic amnesia but consistently accessible in directed forgetting.

Not too much should be made of these differences, however, until someone uses a postinput or intraserial cue within a standard directed forgetting procedure under condi-

tions of hypnosis. A variety of such experiments are possible. For example, the standard intraserial and postinput cuing of item sets could be compared in conditions in which the cue is offered either as a waking instruction or as a hypnotic (or posthypnotic) suggestion. Alternatively, hypnotic and nonhypnotic cuing could be compared for items that have been mastered over multiple study trials rather than the single passes that characterize conventional directed-forgetting experiments. In such studies, it will be important to classify subjects with respect to either hypnotizability, response to amnesia suggestions, or preferably both. Hypnotic phenomena can be properly studied only in subjects who are capable of experiencing them. Because those highly hypnotizable subjects who produce a dense suggested amnesia amount to no more than 5% to 10% of the population (Hilgard, 1965), the small unselected samples characteristic of verbal-learning studies are likely to miss such individuals entirely. If they do, then whatever differences may exist between the hypnotic and nonhypnotic procedures will remain hidden. Even when individual differences in hypnotizability are taken into account, further inferential problems remain. Although the induction of hypnosis increases a subject's response to suggestions over what is observed in the normal waking state (Hilgard, 1965, 1977), the two forms of suggestibility are highly correlated, implying the existence of a set of cognitive skills that are enhanced by but not limited to the hypnotic state. Thus, when given the directed-forgetting cue in the normal waking state, hypnotizable subjects might respond positively by doing something "hypnotic," while unsusceptible subjects might achieve the same end product by doing something else. The inference of a common process would be strengthened, not just by equivalent effects of the two procedures on recall and recognition, but also by equivalent correlations between memory and hypnotic responsiveness.

Comparison of Underlying Mechanisms

Those who work in the area of directed forgetting have considered some half-dozen or so theoretical propositions concerning the mechanisms underlying the phenomenon

(Bjork, 1972; Epstein, 1972); at the same time, investigators of hypnotic amnesia have considered an overlapping set of hypothetical mechanisms (Hilgard, 1966, Kihlstrom, 1977). These theories form a third and final basis for comparison of the two phenomena.

For both hypnotic amnesia and directed forgetting, one idea can be rejected out of hand: the "erasure," or "dumping," hypothesis. In hypnotic amnesia, the critical material is readily recovered following administration of a prearranged cue; in directed forgetting, the continued availability of the forget items in memory is demonstrated by recognition testing, intrusion of to-be-forgotten items into the recall of to-be-remembered items, and the like. Thus it is unreasonable to suggest that the targets of the forget cue have been dumped from long-term memory storage. Rather, some operation must have been carried out on the items that renders them at least temporarily inaccessible to recall.

A possibility that cannot be dismissed so easily concerns voluntary response withholding. For direct forgetting, Epstein (1972) argued that those studies that relied solely on measures of recall or recognition of the to-be-forgotten items were quite open to the possibility that subjects actively withheld or suppressed items targeted by the forget cue. However, both he and Bjork (1972) indicated that this could not account for the entire pattern of results obtained in directed-forgetting studies—particularly those concerned with various aspects of transfer. Hypnotic amnesia is much more vulnerable to an account in these terms, because the research relies so heavily on measures of recall and recognition. In fact, a number of social-psychological approaches to hypnosis offer accounts of amnesia along these lines (e.g., Coe, 1978; Sabin & Coe, 1979; Spanos, 1982; Spanos & Radtke-Bodorik, 1980). The idea is that hypnotic subjects engage in strategic behavior designed to conform to the hypnotist's explicit suggestions and more subtle demands contained in the wider situational context. So far as amnesia is concerned, one such strategy is verbal inhibition or secret keeping. However, this notion cannot easily account for the observation that recognition is frequently superior to recall. Surely it is as easy to say "no" to recognition items as it is to say noth-

ing on a free-recall test. Moreover, if the subjects' own self-reports are to be believed, simple verbal inhibition does not account for very much amnesia. Thus, response withholding can be rejected as a general account of amnesia, though a different form of the response suppression hypothesis remains viable, as discussed below.

Bjork (1972) accounted for directed forgetting in terms of two processes: selective rehearsal and list segregation. The first mechanism is fairly specific to the intraserial cuing of item sets: the notion is that once the person receives the forget cue, he or she stops rehearsing the items that preceded it and focuses rehearsal on those that follow it. Bjork noted that selective rehearsal cannot account for directed forgetting induced by the postinput cuing of item sets, because all the items in question have already been rehearsed and encoded by the time that the forget cue is administered. This is also the case in hypnotic amnesia, especially those instances in which the subject has had repeated study trials with the list and has mastered them to a criterion of learning before the amnesia suggestion is delivered.

At first glance, Bjork's (1972) other hypothetical mechanism, list segregation, has more promise when applied to hypnotic amnesia. The idea is that the forgetting cue helps the subject distinguish between the two lists by adding a tag or context cue that identifies list membership. Even though the forget items have had some opportunity for rehearsal, then, the fact that the items have been differentially grouped may reduce the interference of to-be-forgotten items on to-be-remembered items to some degree. When applied to hypnotic amnesia, the hypothesis predicts that items covered by the suggestion may continue to interfere, at least to some degree, with other ongoing mental activities; however, it also predicts that forget items will be recallable to the extent that they were rehearsed during the input phase. The problem, of course, is that posthypnotic amnesia appears to involve a temporary *inability* to remember material that was thoroughly rehearsed during hypnosis. Thus Bjork's theory, which appears to account for directed-forgetting effects quite well, does not appear to account for hypnotic amnesia. Given adequate rehearsal of forget items and adequate

segregation of forget and remember items in memory, some additional mechanism needs to be postulated to account for the amnesic subject's inability to remember the set of items covered by the forget cue.

Epstein's (1972) selective search hypothesis may be helpful in this respect. Epstein begins with the assumption that the forget cue serves to partition the input into separate item sets, in a manner similar to Bjork's item-segregation mechanism. Epstein goes further, though, in proposing that the effect of the forget cue is to direct memory search processes away from forget items and toward remember items. Effectively, then, the size of the remember set has been reduced from what it would have been had there been no forget cue at all. This means that the subject is less likely to examine members of the inappropriate set and will reach the target items in the appropriate set more quickly. The only problem, however, is that the selective hypothesis predicts that the items covered by the forget cue will be readily accessible, provided that the subject is directed to search for them. Again, this is just what does *not* appear to happen in hypnotic amnesia. For example, a recognition test would seem to constitute just such a direction. While recognition is often superior to recall in hypnotic amnesia, just as it is in normal waking memory, the available evidence indicates that it is still inferior to free recall after amnesia has been lifted.

Now Geiselman et al. (1983) have offered yet another hypothetical mechanism, retrieval inhibition, to account for directed forgetting. The proposal is that the cue to forget sets in motion some process that effectively disrupts retrieval, so that items available in memory are rendered inaccessible under conditions of ordinary free recall. Their experiments use a variant of cuing by item sets, except that only some items occurring before the cue are targeted for forgetting. Nevertheless, they find that memory is diminished for both experimental and control items. Items of both types remain available in memory, however, as indicated by recognition testing. This "undirected" forgetting of control items is not an artifact of confusion between experimental and control items or of output interference. Differential rehearsal cannot account for this effect because the control

items were not rehearsed at all, only judged for pleasantness; nevertheless, control items presented before the forget cue are less accessible than those that followed it. Moreover, the success of the recognition procedure indicates that the items were successfully encoded during the study phase; this also argues against response withholding. List segregation and directed search are not viable alternatives either, because the items cannot be recalled when the subjects are instructed to do so. Everything seems to point to some sort of retrieval inhibition.

Hypnotic amnesia also seems to involve some sort of retrieval inhibition, resulting in an inability to remember critical material targeted by the suggestion. More specifically, it has been proposed that amnesia involves a disruption in memory search, so that material available in memory cannot be easily accessed by the subject (Kihlstrom & Evans, 1979). In support of this notion, it has been found that partially amnesic subjects show a significant disruption in the organization of recall. Interestingly, Geiselman et al. (1983) found a similar disorganization effect in the recall of both experimental and control items covered by the forget cue. This disruption may reflect either the loss of relevant retrieval cues, the failure to engage in retrieval strategies that are appropriate to available cues, or both. This disruption may be viewed, from the perspective of Hilgard's neodissociation theory of divided consciousness, in terms of a temporary loss of those contextual features that mark memories as representing specific episodes in the person's life (Kihlstrom, 1982). Such a dissociation will result in marked deficits in recall, and even recognition, because both tasks require that the subject reconstruct the spatial and temporal context in which the events occurred. It will also produce disorganized recall if the retrieval strategy used by the subject requires the missing featural information. Nevertheless, the memories will remain available in storage and will continue to interact (outside of awareness) with other ongoing cognitive processes, so long as the tasks do not require the missing cue information. Certain social-psychological approaches to hypnosis also use retrieval inhibition as an explanatory construct, with the difference that the process is construed as remaining under voluntary con-

control (Spanos, 1982; Spanos & Radtke-Bodorik, 1980). For example, some subjects may actively engage in self-distraction maneuvers that prevent them from accessing target items, in response to contextual demands. However, self-distraction and other self-handicapping strategies do not always result in amnesia, nor do changing contextual demands always alter subjects' memory reports (Kihlstrom, 1978, 1982). In the final analysis, a complete theoretical account of amnesia will have to include reference both to cognitive factors underlying dissociation and to the social context in which dissociation occurs.

Although some sort of retrieval inhibition appears to be implicated in both directed forgetting and hypnotic amnesia, it is not yet clear that it is the *same* sort in both cases. The parallels found by Geiselman et al. (1983) are very suggestive, but there is still a great deal to be explained. In directed forgetting the inhibition seems to reduce proactive interference, whereas amnesia does not appear to reduce retroactive interference. Moreover, amnesia can be reversed so that the target items become accessible to free recall; such a reversal still needs to be demonstrated within their procedure. Further research on both phenomena is needed to clarify the relationship. Of course, the real mystery concerns the procedures that are evoked by just a few simple words and that alter memory in such dramatic ways.

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