The International Journal of Clinical and Experimental Hypnosis
1978, Vol. XXVI, No. 4, 292-306

RELATIONSHIP OF POSTHYPNOTIC AMNESIA TO WAKING MEMORY PERFORMANCE[1]

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Abstract: It has been suggested that the occurrence of amnesia after hypnosis is related to a predisposition toward forgetfulness manifested by Ss in ordinary waking life. On the basis of standardized scale performance, 20 hypnotizable Ss were classified as amnesic or nonamnesic, according to a strict criterion for suggested, temporary posthypnotic amnesia. These Ss received a battery of memory tests administered in the normal waking state. Measures of visual and auditory short-term memory, and long-term memory assessed under conditions of incidental learning, revealed no differences between amnesic and nonamnesic Ss. Measures of long-term memory collected under intentional learning conditions, however, showed superior retention by the amnesic Ss. A poor waking memory does not appear to be involved in the development of posthypnotic amnesia.

An important area of hypnosis research has to do with the cognitive and personality correlates of hypnotic phenomena. For example, research has shown that those people who are hypnotizable have a greater capacity for involvement in imaginary activities or "absorption" (e.g., Ås, 1963; J. R. Hilgard, 1970, 1974; Shor, Orne, & O'Connell, 1962; Tellegen & Atkinson, 1974), perhaps are more creative (Bowers & Bowers, 1972), require less effort to become absorbed, produce creative ideas, or conjure up mental images (Bowers, 1978), and slip more readily into other altered states of awareness such as sleep (Evans, 1977), compared to those individuals who are insusceptible to hypnosis. In much the same manner, specific hypnotic phenomena appear to be correlated with particular individual-difference variables as measured in the wak-

Manuscript submitted July 25, 1977; final revision received September 29, 1977.

[1]This research was supported in part by a grant from the Harvard Graduate Society, and in part by Grant MH 22951 from the National Institute of Mental Health, United States Public Health Service.

[2]The authors would like to thank Robert H. Dworkin and Reid Hastie for their help in planning the experiment.

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ing state. Thus, primary motor suggestibility is correlated with response to ideomotor suggestions given during hypnosis but not with suggested cognitive alterations (Evans, 1967); and J. R. Hilgard (1970) has reported that vividness of mental imagery is more strongly associated with the production of positive hallucinations, dreams, and age regression than with negative hallucinations, posthypnotic amnesia, and challenge motor suggestions. Evidently, certain characteristics of the person lay the foundation for the experiences that he or she will have while hypnotized.

As noted by E. R. Hilgard (1966), this sort of relationship between hypnotic behavior and waking individual differences has sometimes been proposed for posthypnotic amnesia, as follows. Some people are definitely more "forgetful" than others: while they may not actually lose memories from storage altogether, they do seem particularly prone to lose track of these memories, so that they find it difficult to remember things that other people, and even they themselves on other occasions, are able to remember quite easily. It is possible that these people, when hypnotized and given appropriate suggestions, capitalize on what is usually construed as a disability to respond positively to the suggestion, thus parlaying their forgetfulness into a means of producing the phenomenon of posthypnotic amnesia.

The major objection to this line of reasoning is, of course, that posthypnotic amnesia is reversible and thus represents a temporary deficit in the retrieval of memories rather than their permanent loss from storage (Hull, 1933; Kihlstrom & Evans, 1976; Nace, Orne, & Hammer, 1974; Orne, 1966). However, recent conceptions of memory suggest that ordinary forgetfulness is also a problem of memory retrieval, rather than the decay or loss of memories from storage (e.g., Shiffrin, 1970; Tulving, 1974), so the parallel remains intact. Nevertheless, although the administration of the reversibility cue does lead to significant recovery of previously blocked memories, Kihlstrom and Evans (1977) found that this recovery was less than complete. In brief, those Ss who showed posthypnotic amnesia on initial testing continued to remember relatively less than their nonamnesic counterparts, even after the amnesia suggestion had been cancelled and some previously blocked memories recaptured. This difference in final recall between amnesic and nonamnesic Ss was originally observed by Hilgard and Hommel (1961) who suggested that it represented the "residual" effect of the suggestion for posthypnotic amnesia. Of course, it could just as easily represent a "forgetfulness" of the sort described earlier: absentminded people tend to forget things, so they pass the amnesia test; but their forgetfulness persists even after the reversibility cue has been given, so they also show residual amnesia.

There have been only two direct attacks on this problem. In the first, Hammer (1965) administered the Jung word-association test to hypnotizable Ss who had been found in previous testing to be either amnesic or nonamnesic after hypnosis. On the first trial they were asked to free associate to 50 words (half emotionally arousing, half neutral) in the usual manner; on the second trial they were asked to repeat the responses made on the first trial. The amnesic Ss forgot an average of 11.8 items (7.9 emotional and 3.9 neutral words), compared to 7.2 items (5.4 emotional and 1.8 neutral) in the nonamnesic Ss, a difference which was statistically significant. Commenting on these results later, Hammer (1970) suggested that posthypnotic amnesia might be related to "a talent for nonrecall that extends beyond the trance situation [p. 7]."

In a later study, Kihlstrom and Evans (1975) conducted a similar experiment with different materials. A total of 100 Ss participated first in two tests of normal waking memory; recalling the nine cities on the itinerary of a trip described in a short passage of prose and arranging in correct chronological order four sets each containing three prominent news events, the events in each set being listed randomly. Later, Ss received a standardized hypnotic procedure which included a suggestion and test for posthypnotic amnesia. The most relevant comparison was between the 21 hypnotizable Ss who showed posthypnotic amnesia and their 19 counterparts who were nonamnesic. Contrary to the findings of Hammer (1965, 1970), the amnesic Ss tended to perform better than the nonamnesic Ss on both the itinerary and event-ordering tasks (7.0 versus 6.4 cities recalled, and 2.9 versus 2.7 sets arranged correctly, respectively). These findings led Kihlstrom and Evans (1975) to doubt the simple forgetfulness hypothesis and to suggest that amnesic Ss might even have *better* memories than nonamnesic Ss.

The studies of Hammer (1965) and Kihlstrom and Evans (1975) differed in several respects. In the first place, Hammer tested his Ss' memory for very recent events (i.e., free associates elicited just minutes before), whereas the critical material in the study of Kihlstrom and Evans consisted of a story that had been read 30 minutes earlier and news events that had taken place as many as 5 years prior to testing. Moreover, Hammer's material was essentially a list of words, while that of Kihlstrom and Evans had a more experiential flavor. Finally, Hammer explicitly tested incidental memory, but the tasks chosen by Kihlstrom and Evans, especially the itinerary recall task, probably had a large element of intentional learning. One or more of these factors may have contributed to the discrepancies in the results of the two studies.

A further important problem in this area has to do with the selection of Ss and particularly with the criterion established for choosing amnesic and nonamnesic Ss. Kihlstrom and Evans (1975) based their S selection on the criterion for posthypnotic amnesia set by the standardized scales

of hypnotic susceptibility, which takes into account only Ss' response to an initial test of posthypnotic amnesia. A better criterion, however, also takes into account the recovery of memory that may occur after S receives a pre-arranged reversibility cue (Kihlstrom & Evans, 1976; Nace et al., 1974). The presence or absence of significant reversibility may indicate that an ostensibly amnesic S was actually pseudo-amnesic, or that an apparently nonamnesic S in fact experienced a partial amnesia. A criterion that relies only on the initial amnesia test does not permit these finer distinctions and thus may help obscure differences between truly amnesic and nonamnesic Ss that may actually exist.

The present study was designed to provide more information concerning the waking memory correlates of posthypnotic amnesia by taking into consideration the factors outlined above. Because the study was concerned with individual differences associated specifically with response to amnesia suggestions, and not with those correlating with hypnotizability as such, only Ss of relatively high hypnotizability were selected for the experiment. They were then classified as amnesic or nonamnesic Ss on the basis of a strict criterion for amnesia which considered both initial amnesia response and subsequent reversibility. The assessment of waking memory tapped several different modalities, retention intervals, and conditions of learning. The "forgetfulness" hypothesis of posthypnotic amnesia suggests that on some of these tests, at least, amnesic Ss should perform more poorly than nonamnesic Ss.

Method

Subjects

The Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) of Shor and E. Orne (1962) was administered by tape-recording to a total of 154 volunteers from the Harvard University student population. The Ss were run in groups ranging from 10 to 24 persons in size and were paid $4.00 for their participation in the experiment. On the basis of their HGSHS:A scores, Ss were classified as low (0-4), medium (5-7), or high (8-12) in susceptibility to hypnosis. This study concerns only those 67 Ss (43.5% of the total) who met the criterion for high hypnotic susceptibility.

Procedure

The HGSHS:A contains a suggestion for temporary posthypnotic amnesia for the events and experiences of hypnosis and two tests of response to the amnesia suggestion. On the first test, Ss are simply asked to report, in writing, the events that transpired during the administration of the scale. According to the standard scoring criterion, Ss who recall no more than three of the nine critical items are considered to pass

the amnesia suggestion. Then the reversibility signal is given to lift the amnesia, and *S* is asked to report those additional events that he remembers now but did not remember before. Kihlstrom and Evans (1976) have proposed a criterion for reversibility that requires *S* to recall at least two new items on the second test. The criteria for initial amnesia and subsequent reversibility were employed to form subgroups of highly hypnotizable *Ss* classified according to their amnesia performance: passing both initial amnesia and reversibility (amnesic, $N = 24$); passing initial amnesia but failing reversibility (possibly pseudo-amnesic, $N = 10$); failing initial amnesia but passing reversibility (possibly partially amnesic, $N = 8$); and failing both initial amnesia and reversibility (nonamnesic, $N = 25$). Those *Ss* who were clearly amnesic ($N = 24$) or nonamnesic ($N = 25$) were then contacted and invited to return to the laboratory for an individual experiment concerned with the cognitive correlates of hypnotic response. They were told only that the experiment involved a battery of memory tests administered in the normal waking state; no mention was made of posthypnotic amnesia. Recruitment continued until 10 *Ss* in each group completed the experiment. The *Ss* were paid $3.00 for their participation in this session. The *E* who conducted the waking memory sessions was not aware of *Ss*' group membership.

Incidental memory. At the beginning of the memory testing session, *Ss* were told that they would receive a series of "warm-up" tasks before engaging in the memory tasks proper. They then completed the Hooper Visual Organization Test (HVOT; Hooper, 1958), which requires *S* to identify 30 familiar objects depicted by line drawings which have been broken up into two or three pieces arranged randomly on the page. The *Ss* were allowed to work through the booklet at their own speed, while *E* recorded their oral reports. Following this, *Ss* engaged in a series of mental arithmetic tasks: counting forward and backward by 1's, descending 3's, and descending 7's, all counts beginning from different three-digit numbers and continuing until *S* had made 25 additions or subtractions. The *Ss* were instructed to do the mental arithmetic as quickly and accurately as possible. While the mental arithmetic tasks were ostensibly a continuation of the warm-up exercises, their true function was to clear *S*'s short-term memory for the items of the HVOT. Following the mental arithmetic, *Ss* were asked to recall as many of the HVOT items as they could; testing continued until *S* reached an impasse. Then *E* read a list containing the 30 HVOT items and 30 similar distractor items and asked *S* to identify those items that he recognized as having been on the test.

Digit span. The *Ss* received the Digit Span subtest of the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1955), administered according to the standard procedure. Pretesting indicated that some *Ss* would receive perfect scores on the WAIS digit span; therefore, to avoid ceiling effects, the usual list was expanded to include strings up to 13 digits in

length for forward recall and 12 digits for backward recall.

Visual memory. Following the digit span test of auditory short-term memory, Ss received a test of visual short-term memory adapted from the Benton Revised Visual Retention Test (BRVRT; Benton, 1974). Again, pretesting with the standard form of the BRVRT yielded many perfect or near-perfect scores and threatened ceiling effects. Accordingly, a more difficult version of BRVRT was constructed by combining corresponding figures from the three published forms of the test. Thus, the first figures (I) of Forms C, D, and E were arranged vertically and photographed to produce a single stimulus card containing the original figures in three separate panels; this procedure was also followed for Figures III, V, VII, and IX of the BRVRT. The Ss were shown the stimuli for 15 seconds, and they reproduced each one immediately after it was withdrawn.

Prose memory. The Ss received the Logical Memory subtest of the Wechsler Memory Scale, Form I (WMS:I; Wechsler, 1945), which consists of single paragraphs drawn from two newspaper stories. The paragraphs were read aloud to Ss in a normal narrative style, and they were asked to recall each paragraph verbatim, orally, while *E* recorded their responses.

Free recall. For their final task, Ss were read a list of 50 common words with instructions to recall them in any order that they wished. The list consisted of five instances of each of 10 categories provided in the Battig and Montague (1969) norms: parts of the body, types of music, articles of furniture, weather phenomena, four-footed animals, materials, geographical formations, occupations or professions, metals, and literary forms. The Ss received three study-test trials under standard free-recall conditions. Memory reports were collected in writing, and on each trial testing continued until *S* reached an impasse.

Results

The parameters of HGSHS:A performance for the total group of 154 Ss were similar to those that have been obtained in similar volunteer samples elsewhere ($\overline{X}$ = 6.94, *S.D.* = 2.57). The average HGSHS:A score of the final sample of 20 highly hypnotizable Ss ($\overline{X}$ = 8.95, *S.D.* = 1.00) did not differ significantly from that of the larger population of 67 highs from which it was drawn ($\overline{X}$ = 9.28; t = 1.48; $d.f.$ = 19, n.s.). In addition, the scale scores of the amnesic ($\overline{X}$ = 9.10, *S.D.* = .99) and nonamnesic ($\overline{X}$ = 8.80, *S.D.* = 1.03) groups did not differ (t = .33, $d.f.$ = 19). The amnesic Ss recalled an average of 2.6 items on the initial amnesia test and 3.7 more items on the subsequent reversibility test; corresponding figures for the nonamnesic Ss were 5.2 and 0.6 items, respectively. Summing across the two posthypnotic memory tests, the amnesic and nonamnesic Ss recalled a total of 6.3 and 5.8 of the nine critical

items, respectively, a difference which is not statistically significant ($t = 1.02$, $d.f. = 18$, n.s.).

Short-Term Memory

The Digit Span subtest of the WAIS and the BRVRT are typical tests of short-term memory in the auditory and visual modes, respectively. Table 1 compares the performance of the amnesic and nonamnesic Ss on the adaptations of these tests employed in the present experiment.

TABLE 1

PERFORMANCE OF AMNESIC AND NONAMNESIC Ss ON WAKING TESTS OF SHORT-TERM MEMORY

Test	Amnesic Ss		Nonamnesic Ss		t
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	
Digit Span:					
Forwards	7.50	1.65	8.30	1.95	0.99
Backwards	6.50	1.27	7.20	1.69	1.05
Total	14.00	2.58	15.50	3.34	1.12
Visual Memory:					
Number Correct	6.90	1.20	6.70	1.49	0.33
Total Errors	14.90	4.48	16.10	6.62	0.47
Omissions	4.40	2.84	4.70	1.89	0.28

Auditory digit span. According to the procedure employed in the WAIS, digit span was scored separately for forward and backward conditions, and these two scores were also combined to yield a total score. Although there was a slight advantage for the nonamnesic Ss on all three measures, the differences did not approach statistical significance. Student Ss typically are able to reproduce one more digit in the forward condition than in backward recall: both groups of Ss fit this pattern.

Visual memory. The BRVRT is scored for both the number of stimuli reproduced correctly and for the total number of errors made. A single error is enough to have a reproduction scored as incorrect, but there are many opportunities for error on any given design: rotations, omissions, substitutions, inaccuracies of various sorts, etc. Each separate error made enters into the total error score; clearly this score is more sensitive than that based on the simple number of correct reproductions. The version of the test employed here included a total of 15 BRVRT stimuli (three on each of five cards). Table 1 shows that for the test as a whole, the amnesic and nonamnesic Ss made the same number of correct reproductions and committed the same total number of errors. Of particular interest was that category of errors scored as omissions, in which S simply leaves out a portion of the stimulus figure. If amnesic Ss were predisposed to exert insufficient effort to successfully retrieve items stored in memory, we might expect them to show a greater number of

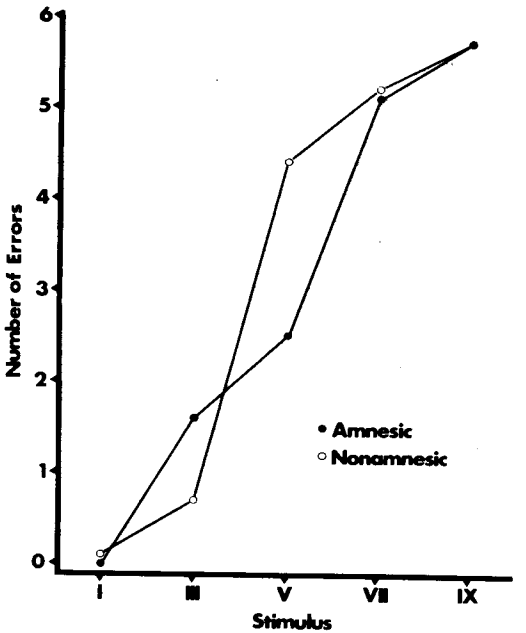

FIG. 1. Average number of errors for amnesic and nonamnesic Ss on each stimulus of the test of short-term visual memory.

omission errors, compared to nonamnesic Ss. This difference was not found for the test as a whole.

The five stimuli employed in this test varied in complexity, hence difficulty. Accordingly, a more detailed analysis of the results was performed by considering performance on each of the five test stimuli taken separately. Figure 1 shows the average number of errors made on each stimulus for the amnesic and nonamnesic Ss. Comparable results were obtained when the protocols were scored for correct reproductions and for omission errors only. The Ss' scores on each of the three test measures (i.e., number correct, total errors, and omissions) were submitted to separate repeated-measures analysis of variance. All analyses yielded the same results: a significant effect of stimuli (correct: $F = 72.90$, $d.f. = 4, 72$; errors: $F = 52.59$, $d.f. = 4, 72$; omissions: $F = 12.98$, $d.f. = 4, 72$; all $p < .001$) but no effect of condition (correct: $F = .11$, $d.f. = 1, 18$; errors: $F = .23$, $d.f. = 1, 18$; omissions: $F = .08$, $d.f. = 1, 18$) and no interaction of conditions with stimuli (correct: $F = 2.12$, $d.f. = 4, 72$; n.s.; errors: $F = 2.26$, $d.f. = 4, 72$; n.s.; omissions: $F = .97$, $d.f. = 4, 72$). Thus, both groups did more poorly on the more difficult stimuli; but the amnesic and nonamnesic Ss did not differ in overall performance, nor did they show differential changes in performance with the various stimuli.

Long-Term Memory

The remaining three tests were concerned with retention over somewhat longer intervals than the digit span and visual memory tests. These tests varied in terms of the meaningfulness of the to-be-remembered material: the prose passages, of course, possessed syntactic organization as well as semantic relationships among the words within a sentence and the sentences themselves; although the word list in the free recall procedure contained no syntactic organization, the words were representative of different taxonomic categories; the items of the HVOT represented more of a miscellany. In addition, Ss were explicitly instructed to remember the prose passages and the word list, but they were surprised by the demand to remember the HVOT items. Table 2 presents the essential results of these tests.

Prose memory. Reproduction of the prose passages was scored according to the procedure of the WMS:I, counting only those elements (out of a total of 20 per passage) that were recalled verbatim. A repeated-measures analysis of variance showed a main effect for conditions (F = 6.72, $d.f.$ = 1, 18; $p<.05$) and a strong trend for passages (F = 4.25, $d.f.$ = 1, 18; $p<.10$), but no interaction of condition and passage (F = .18, $d.f.$ = 1, 18). While the second passage was more difficult than the first (probably because of proactive interference from the first passage), overall the amnesic Ss showed significantly better memory than the nonamnesic Ss.

Multitrial free recall. Memory for the list of 50 words was scored in

TABLE 2

PERFORMANCE OF AMNESIC AND NONAMNESIC Ss ON WAKING TESTS OF LONG-TERM MEMORY

Test	Amnesic Ss		Nonamnesic Ss		t
	$\bar{X}$	$S.D.$	$\bar{X}$	$S.D.$	
Prose Memory[a]:					
Passage 1	13.60	3.41	9.60	4.45	
Passage 2	10.70	3.83	7.70	2.87	
Total	24.30	5.76	17.30	6.31	2.59*
Free Recall[b]:					
Number Recalled	41.80	6.48	33.30	4.55	3.39**
Clustering Ratio	.55	.29	.67	.14	1.20
Incidental Memory:					
Number Correct	28.75	1.14	28.35	.88	.88
Number Recalled	14.80	3.71	13.30	2.21	1.10
Number Recognized	27.40	1.71	26.30	1.64	1.47

[a]Number of passage elements recalled verbatim.

[b]Trial 3 only. See Figure 2 for comparable figures across trials.

*$p<.05$.

**$p<.01$.

terms of the number of items correctly recalled (excluding repetitions) and the amount of category clustering (excluding repetitions and intrusions) shown by Ss. Clustering was indexed by the ratio of the number of items appearing in adjacent postitions on the output list that were from the same taxonomic category to the total number of words recalled; this is the Repetition Ratio (RR) devised by Bousfield (1953). Table 2 shows that in the final trial of the series the amnesic Ss recalled significantly more critical items, but they showed slightly less category clustering than the nonamnesic Ss.

Figure 2 shows the recall and clustering scores for the two S groups on each of the three trials. Repeated-measures analysis of variance showed that both recall ($F = 172.69$, $d.f. = 2, 36$; $p < .001$) and clustering ($F = 24.50$, $d.f. = 2, 36$; $p < .001$) increased over trials. There was a main effect for conditions on recall ($F = 9.11$, $d.f. = 1, 18$; $p < .01$) but (appearances to the contrary) not on clustering ($F = .38$, $d.f. = 1, 18$). In neither case was there any interaction between conditions and trials (recall: $F = .64$, $d.f. = 2, 36$; clustering: $F = .75$, $d.f. = 2, 36$). This analysis, therefore, indicated that the two groups were not different with respect to the rate of learning the list. However, across the trials the amnesic Ss showed significantly better recall, but slightly worse clustering, than the nonamnesic Ss.

The difference in outcome of the analyses of recall and clustering is somewhat surprising in view of the fact that taxonomic organization and

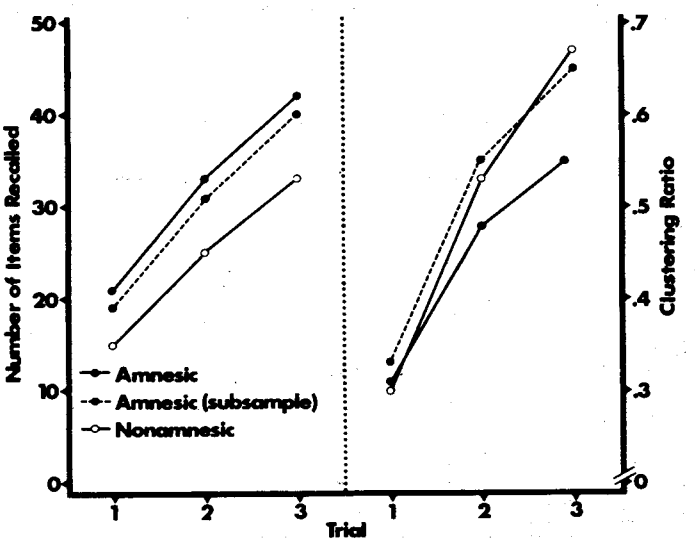

FIG. 2. Average number of items recalled, and average clustering ratio, for amnesic and nonamnesic Ss on multitrial free recall task. Subsample of amnesic Ss excludes two Ss who employed the method of loci.

recall are usually positively related (Bousfield, 1953). During testing, however, two Ss—both in the amnesic group—indicated that they had spontaneously attempted to use the method of loci, a popular mnemonic device, as a strategy in remembering. These Ss showed very high levels of recall but very low levels of clustering for the simple reason that RR is not sensitive to this organizational principle. Accordingly, these Ss were excluded and the analyses repeated. The revised mean recall and clustering scores for the reduced group of amnesic Ss are represented in Figure 2 by broken lines. The corresponding ANOVAs continued, of course, to show a significant effect of the trials on both recall ($F = 171.52$, $d.f. = 2, 32$; $p < .001$) and clustering ($F = 21.40$, $d.f. = 2, 32$; $p < .05$). The significant effect of condition on recall was diminished somewhat ($F = 5.52$, $d.f. = 1, 16$; $p < .05$), while whatever trend towards a group difference in clustering existed previously disappeared entirely ($F = .001$, $d.f. = 1, 16$). Again, there were no Condition x Trials interactions (recall: $F = .90$, $d.f. = 2, 32$; clustering: $F = .001$, $d.f. = 2, 32$). Thus, the amnesic Ss showed a slight but statistically significant advantage in recall over the nonamnesic group, even when the two Ss who used the method of loci were removed from the group.

Discounting the two unusual Ss in the amnesic group, there was no group difference in clustering, although it was noted that the amnesic Ss tended to employ more large categorical clusters. Moreover, the amnesic Ss seemed to build large clusters more rapidly than the nonamnesic Ss. For example, clusters of four items accounted for 10% of the amnesic Ss' words on Trial 2 but almost 25% on trial 3; the corresponding shift for the nonamnesic Ss was from 13% to only 15%.

Serial position curves were plotted from the results of the first recall trial. Visual inspection revealed no prominent differences between the curves for the two groups of Ss, aside from a slightly diminished primacy effect (that portion of the curve which probably reflects long-term memory) among the nonamnesic Ss.

Incidental memory. The amnesic Ss showed a slight and nonsignificant advantage over the nonamnesic Ss in terms of the number of items correctly identified on the HVOT. There was no significant group difference, however, in either free recall or recognition of the test items. The slight differences in memory observed in Table 2 are quite comparable to the initial small difference in the number of correct identifications.

Global memory score. In a final analysis, each S was assigned an overall score reflecting his or her adequacy of memory in general. Representative scores from the five individual memory tests (total WAIS digit span, BRVRT errors, WMS:I prose memory total, number of items recalled on Trial 3 of the multitrial free recall procedure, and the number of items correctly recalled from the HVOT) were transformed to

z scores, which were then summed for each S.[4] The mean values of the resulting global memory scores were .23 ($S.D.$ = .33) for the amnesic Ss and −.23 ($S.D.$ = .39) for the nonamnesic Ss. The difference, although small, is statistically significant ($t = 2.87, d.f. = 18, p < .05$), indicating that overall the amnesic Ss showed slightly superior memory abilities compared to the nonamnesic Ss.

Discussion

When suggestions for amnesia are given and hypnosis is terminated, many deeply hypnotized Ss experience a temporary difficulty in remembering the events and experiences that transpired during hypnosis, while others do not. The present study indicates that this difference in response to amnesia suggestions is not a function of individual differences in the ability to remember material in the normal waking state. Measures of auditory and visual short-term memory, and long-term memory assessed under conditions of incidental learning, revealed no differences between amnesic and nonamnesic Ss. Measures of long-term memory collected under intentional learning conditions showed, if anything, superior retention by the amnesic Ss. The results with respect to intentional long-term memory largely confirm the trends noted in the previous study by Kihlstrom and Evans (1975), while the finding of no difference in incidental memory is somewhat at variance with the results obtained earlier by Hammer (1965).

At least with respect to intentional learning, these results clearly contradict the strong form of the "forgetfulness" hypothesis of posthypnotic amnesia. With due regard to the hazards of accepting the null hypothesis, it appears that a poor waking memory is not one of the major preconditions for developing posthypnotic amnesia. On the contrary, such factors as hypnotic susceptibility and depth of hypnosis attained would appear to be the paramount factors involved in producing this temporary deficit in memory retrieval (e.g., Cooper, 1972; E. R. Hilgard, 1965). On the other hand, the available findings with respect to intentional long-term memory suggest another notion concerning individual differences in memory related to amnesia which diverges from the usual form of the "forgetfulness" hypothesis: Those Ss who can experience posthypnotic amnesia may have *better* memories, in some sense, than those Ss who cannot.

[4]The BRVRT error score was adjusted for this analysis so that positive z scores reflected fewer errors, thus better memory, as was the case for the other tests. The two elements of the WAIS digit span subtest, forward and backward recall, showed a correlation of $r = .66$ in this sample, and thus were combined for the purposes of the present analysis. Otherwise, examination of the correlation matrix revealed no substantial relations among the five tests employed, consistent with the assumption that they each tapped somewhat different aspects of memory function.

In many respects, amnesia lies at the center of the domain of hypnosis —a domain which includes a wide variety of suggested alterations in perception and memory. Thus, hypnotizable Ss who can experience amnesia are also likely to be able to experience hypnotic hypermnesia, age regression, and other paramnesias, as well as the production and inhibition of sensory-perceptual experience associated with positive and negative hallucinations, while hypnotized. The varied nature of these "dissociative" phenomena suggests that Ss who can experience them possess more supple cognitive processes, as well as the ability to manipulate these processes freely in a number of different directions. Specifically, the hypothesis suggests that a positive response to suggestions for hypnotic alterations in memory—whether for amnesia, hypermnesia, or paramnesia—is related to individual differences in the flexibility of memory processes and the degree to which the person can exercise control over them. Amnesic Ss, then, may have not only a talent for forgetting, as Hammer (1970) suggested, but a talent for remembering as well, depending on the circumstances. Further research is required to put this revised hypothesis to an adequate test.

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Die Beziehung der posthypnotischen Amnesie zu der Ausführung des Erinnerns im Wachzustand

John F. Kihlstrom und Mosheh Twersky

Abstrakt: Es ist angedeutet worden, dass das Auftreten einer Amnesie nach Hypnose mit einer Prädisposition zur Vergesslichkeit, wie sie sich bei *Vpn.* im gewöhnlichen, wachen Leben manifestiert, in Beziehung steht. Auf der Basis ihrer Ausführung an einem Standardmaszstab wurden 20 hypnotisierbare *Vpn.* als amnestisch oder nicht-amnestisch gemäss eines strengen Kriteriums für suggerierte, vorübergehende, posthypnotische Amnesie klassifiziert. Diese *Vpn.* erhielten eine gewaltige Anzahl von Erinnerungstests, die ihnen im normalen Wachzustand gegeben wurden. Messungen des kurzfristigen und andauernden Erinnerns, die sich auf Sehen und Hören bezogen und die unter Bedingungen für zufälliges Lernen bewertet wurden, zeigten keine Unterschiede zwischen amnestischen und nicht-amnestischen *Vpn.* Messungen des anhaltenden Erinnerns, die unter vorgesetzten Lernenskonditionen gesammelt wurden, erbrachten jedoch ein ausserordentliches Behalten bei amnestischen *Vpn.* Ein schwaches Erinnerungsverögen im Wachzustand scheint nicht mit der Entwicklung der posthypnotischen Amnesie in Verbindung zu stehen.

Le rapport entre l'amnésie posthypnotique et le rendement de la mémoire

John F. Kihlstrom et Mosheh Twersky

Résumé: Il a été suggéré que l'occurrence de l'amnésie posthypnotique est reliée à la tendance à oublier manifestée par les *Ss* dans la vie quotidienne. Sur la base de leur rendement à une échelle standardisée, 20 *Ss* susceptibles à l'hypnose ont été classés comme amnésiques ou non amnésiques selon un critère strict d'évaluation de l'amnésie posthypnotique suggérée et réversible. Ces *Ss* ont été soumis à une batterie d'épreuves mnémoniques administrée à l'état normal d'éveil. Des mesures de la mémoire visuelle et auditive immédiate et différée, évaluées dans des conditions d'apprentissage incidentel n'ont pas révélé de différence entre les *Ss* amnésiques et non amnésiques. Cependant, les mesures de la mémoire différée, recueillies sous des conditions d'apprentissage intentionnel, ont révélé une rétention supérieure chez les *Ss* amnésiques. La faiblesse de la mémoire ne semble pas impliquée dans le développement de l'amnésie posthypnotique.

La relacíon entre la amnesia posthipnótica y el rendimiento de la memoria

John F. Kihlstrom y Mosheh Twersky

Resumen: Varios autores han sugerido que la ocurrencia de la amnesia posthipnótica tiene una conexión con la tendencia a olvidar, manifestada de los *Ss* en su vida cotidiana. En base a su rendimiento a una escala standard, 20 *Ss* susceptibles a la hipnosis se han clasificado amnesíacos o non amnesíacos según un criterio de valuación de la amnesia posthipnótica sugerida y reversible. Los *Ss* han tomado examenes mnemónicos administrados al estado normal de despertamiento. Medidas de la memoria visual y auditiva immediata y diferencial avaluadas en condiciones de conocimiento incidental no han rivelado diferencias entre los *Ss* amnesíacos y los non amnesíacos. Las medidas de la memoria diferencial, recogidas en condiciones de conocimiento intencional, han rivelado una retención superior en los *Ss* amnesíacos. La debilidad de la memoria no parece implicada en el desarrollo de la amnesia posthipnótica.