

# POSTHYPNOTIC AMNESIA AS DISORGANIZED RETRIEVAL<sup>1</sup>

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The subjective organization of recall provides information about the dynamics and structure of memory. The notion of cognitive structure entails organizing principles that categorize information so that it may be used in later cognitive processes. One source of this organization is the temporal feature of the input (time and circumstances of stimulation, order of presentation, etc.). This report deals with disruptions in normal cognitive processing resulting from suggestions for posthypnotic amnesia.

Studies of posthypnotic amnesia have employed such strategies as verbal report, relearning, retroactive inhibition, and physiological response to index *S*'s memories for the events of hypnosis. These experiments have implicitly tested the hypothesis that posthypnotic amnesia involves a temporary functional ablation of the material from memory. Repeated failure to confirm this hypothesis has led some researchers to the equally extreme notion that the concept "amnesia" has no empirical validity in this context and that it may be subsumed under compliance, role taking, or other motivational and interpersonal phenomena.

Neither position, however, can account adequately for several aspects of posthypnotic amnesia. These phenomena include reversibility<sup>2</sup> (*S* recalls previously blocked items after the amnesia has been lifted by a cue; Orne, 1966) and source amnesia (*S* remembers the experiences of hypnosis, but not the context in which they occurred; Evans & Thorn, 1966). Moreover, when amnesia is tested, even deeply hypnotized *S*s often recall fragmentary details of the hypnotic experience. These *S*s typically report that their memories are unclear and experience considerable difficulty in retrieving items from the memory store.

The facts of posthypnotic amnesia—temporary failure of recall, blurring of context, and difficulty of active retrieval—point to cognitive disorganization as central to its phenomenology. Given that temporal "tags" are attached to cognitive material as an aid to recall, it was predicted that the disorganization that occurs following a posthypnotic suggestion for amnesia would affect the order in which items were recalled. Specifically, it was hypothesized that those hypnotizable *S*s who have incomplete or partial posthypnotic amnesia would retrieve the events in a more random manner than the organized and sequential remembering of insusceptible *S*s.

## METHOD

**Subjects.** The Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A), was administered to 168 male student volunteers. Subsequently, 113 *S*s received the Stanford Hypnotic Susceptibility Scale, Form B (SHSS:B) and Form C (SHSS:C). On the basis of SHSS:C scores, *S*s were classified as low (0-4), medium (5-7), or high (8-12) in hypnotizability.

**Procedure.** Amnesia for the events of the hypnosis session is the last of 12 items on each scale. After hypnosis is terminated, *S* is asked to recall everything that occurred during the scale. Those *S*s who remember fewer than four items meet the amnesia criterion. When *S* indicates that he

can remember nothing more, the cue is given to reverse the amnesia. He is typically able to recover most of the remaining material.

Reports of specific items immediately after awakening constituted the *recall* condition; responses after the cue comprised *reversibility*.

**Cognitive organization.** A preliminary index of organization in recall was calculated for high- and low-hypnotizable *S*s with data obtained from SHSS:C. All observed pairs of consecutively recalled items were tabulated in a frequency table: rows ( $n_i$ ) and columns ( $n_j$ ) enumerated the items in the scale, and the subscript of each cell ( $n_{ij}$ ) identified the  $n$ th and ( $n + 1$ )th items recalled. Thus, each cell entry indicated the number of times any particular permutation of two scale items was observed per group. The index of subjective organization (*SO*) was calculated by the formula provided by Tulving (1962):

$$SO = \frac{\sum n_{ij} \log n_{ij}}{\sum n_i \log n_i} .$$

To determine whether any obtained organization was characterized specifically by temporal sequencing, order-of-retrieval ( $\rho$ ) scores were calculated for each *S* by computing the rank-order correlation between the order of administration of the scale items and the order in which *S* verbalized the items to *E* during the testing of amnesia.

## RESULTS

The *SO* score was .48 for insusceptible *S*s and .32 for hypnotizable *S*s, indicating the presence of more overall organization in the retrieval of information during amnesia for *S*s of low hypnotizability. The first item in the scale was recalled first by insusceptible *S*s almost to the exclusion of the other items, whereas hypnotizable *S*s tended to recall later items first ( $\chi^2 = 16.41, p < .001$ ).

**Recall condition.** Each  $\rho$  score was classified by (a) whether it was positive and statistically significant and (b) the hypnotic susceptibility rating (high, medium, or low) of *S*. The resulting chi-square tests were significant for all three scales (e.g., SHSS:C:  $\chi^2 = 13.86, p < .001$ ). On all forms of the scale there is clear indication that *S*s of relatively high hypnotizability remembered events out of correct order, whereas insusceptible *S*s retrieved events in relatively sequential order.

Analysis of variance of the mean  $\rho$  score for each group of *S*s (see Table 1) also demonstrated a significant

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<sup>2</sup>E. P. Nace and M. T. Orne. "Posthypnotic Amnesia as an Active Psychic Process: An Empirical Study," in preparation.

TABLE 1  
Mean Rho Scores for Order of Recall during Amnesia  
for Ss of High, Medium, and Low Hypnotizability

Scale	Mean rho score			F	df	p <
	Low	Medium	High			
HGSHS:A	.80	.73	.65	1.73	2/84	ns
SHSS:B	.59	.18	.39	3.65	2/77	.05
SHSS:C	.55	.35	.10	4.82	2/87	.05
N <sup>a</sup>	40	27	23			

<sup>a</sup>N based on SHSS:C. As some Ss recalled less than three items on one or two of the scales, N for HGSHS:A and SHSS:B varied slightly (see df columns).

(negative) relationship between hypnotizability and orderliness of recall. The rho scores of hypnotizable Ss were significantly lower than those of insusceptible Ss (e.g., SHSS:C:  $t = 3.63, p < .001$ ).

The multiple correlation of number of items retrieved in the recall condition and rho with hypnotizability was calculated. This combination of items recalled and rho predicted hypnotic susceptibility better than either factor alone. The tendency for hypnotizable Ss to recall in a disorganized manner did not appear to be an artifact of their tendency to recall fewer items during the testing of amnesia.

**Reversibility.** After amnesia was lifted, retrieval order did not seem to be related to hypnotizability. There was a significant tendency for Ss who reversed their amnesia to retrieve items in random order during the recall condition (e.g., SHSS:C:  $\chi^2 = 9.20, p < .005$ ).

## DISCUSSION

The combination of (a) recall of only a few items, (b) reversibility, and (c) disorganized retrieval delineates the major phenomena of posthypnotic amnesia. These phenomena are present mostly in highly hypnotizable Ss. The results suggest that Ss who do *not* recall items in the correct sequence should be considered to display partial posthypnotic amnesia, even though most of them fail the standard criterion for an amnesic response.

It is sometimes asserted that those who are able to experience deep hypnosis are relatively disorganized in their everyday life. Thus, it is possible that the phenomenon

reported here may be independent of hypnosis. Although the reversibility data are not conclusive, the results indicate that cognitive disorganization is a *function* of hypnosis at least as much as it is a *characteristic* of hypnotizability.

A posthypnotic suggestion for amnesia has subtle and unexpected effects on S's cognitive organization. Hypnotizable Ss retrieve those few events available to them in random order, as opposed to the reasonably organized manner of recall of insusceptible Ss. This differential effect is probably removed after amnesia is lifted. The disorganization is manifested by those who are otherwise responding positively to hypnosis, as opposed to those who have few or no hypnotic experiences.

This research indicates that any conclusions questioning the validity of the construct "posthypnotic amnesia" are unwarranted. Posthypnotic amnesia appears to disrupt the normal cognitive operations of partially amnesic Ss: it is harder to retrieve the relevant materials because the context in which they are embedded is obscured. The results suggest that one common conception of posthypnotic amnesia ought to be altered. It is not a complete functional separation of consciousness, but rather a blurring of context, resulting in cognitions that for a time are only tenuously linked with the thought structures of waking life. Further, the results suggest that order of retrieval during recall may be useful in predicting S's future hypnotizability and in separating the effects of amnesia from those of demand characteristics.

This study provides additional evidence of temporal coding in cognitive processing; recall seems to be aided by cues anchored in time. These phenomena have been overshadowed by concern with conceptual clustering. The results also bolster the distinction between "availability" and "accessibility" of cognitive contents (e.g., the "tip of the tongue" phenomenon). The hypnosis paradigm presented here may provide a useful tool for the study of cognitive organization in its own right.

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