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THE EFFECT OF HYPNOTIC AMNESIA
ON
RECALL AND RECOGNITION MEMORY

BY

PATRICIA A. PARMASHWAR, B.Sc., B.A.

A Thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of

Master of Arts

Department of Psychology

Carleton University

Ottawa, Ontario

January 10 1995

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submitted by Patricia A. Parmashwar, B.Sc., B.A.
in partial fulfilment of the requirements for
the degree of Master of Arts

Thesis Supervisor

Chair, Department of Psychology

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January 11 1995

ABSTRACT

Two opposing cognitive views on hypnotic behaviour and more specifically hypnotic amnesia dominate the literature. The special state process according to Kihlstrom views hypnotic amnesia as a dissociation between the episodic and semantic components of memory. Hypnotically amnesic subjects experience an inability to recall target material and are unable to generate retrieval cues that are necessary to reinstate recall. They have loss control of their memory processes.

The social psychological perspective contends that hypnotic amnesia is due to attentional shifts away from the target material. A conscious effort is made to disattend from the retrieval cues that are present at the time of the amnesic challenge. This temporary forgetting does not reflect a dissociation in memory. This nonstate view sees hypnotic behavior as a strategic enactment of a goal-directed behavior.

This study was designed to investigate how modifying the hypnotic amnesia suggestion affects recall and recognition memory and thus, examine the above mentioned hypotheses. Sixty Carleton University undergraduates who scored in the upper range (4-7) of the CURSS and passed the amnesia suggestion were randomly assigned to four groups (n=15). Each group

received a differently worded amnesia suggestion designed to manipulate recall and recognition accuracy. All subjects were administered a taped hypnotic induction procedure prior to achieving the learning criterion for a twelve-word list. Each group was then tested for recall and recognition memory at 1) the learning stage, 2) the amnesia stage, and 3) the post-amnesia stage.

The results were subjected to a 4 X 2 two factor design and post hoc analysis. These analyses showed a significant difference between suggestion types on the recall amnesia trial and a trend towards significance between recognition amnesia scores and suggestion type.

In general, the findings showed a predominance in the particular type of memory deficit as suggested by the wording of the amnesia suggestion and showed further support for the social psychological perspective of hypnosis. Hypnotic amnesia is a strategic enactment understood in terms of how subjects interpret their situation and how they attempt to present themselves through their actions. The results are consistent with the social psychological perspective and inconsistent with the dissociation hypothesis as held by Kihlstrom.

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INTRODUCTION

Hypnotic procedures typically involve a two step process. The first step involves the administration of a hypnotic induction procedure. This procedure defines the situation as hypnotic and usually consist of interrelated suggestions phrased to imply that the subjects will experience sleepiness, relaxation, and entrance into a hypnotic state (Spanos, 1982; 1986; 1992).

Following the induction procedure, test suggestions are given. These invite subjects to carry out responses which are traditionally associated with hypnosis (for example, analgesia, amnesia, and hallucination) (Spanos, 1986). Hypnosis is marked by the "classic suggestion effect", in which hypnotic responses are reported as occurring involuntarily (Spanos, 1982; 1986; 1992; Spanos & Radtke, 1982; Weitzenhoffer, 1974).

Throughout its history, one of the phenomena most central to the topic of hypnosis has been hypnotic amnesia (Sarbin & Coe, 1972). Hypnotic amnesia is defined as a temporary suggestion-induced decrease in memory performance. Its temporary nature is demonstrated by the reversibility of the memory performance deficit following presentation of a prearranged cue which 'cancels' the amnesia (Spanos & Radtke-Bodorik, 1982; Spanos, 1982; Spanos, 1986).

A variety of theories have evolved in an attempt to explain the underlying processes involved in this induced memory deficit phenomenon. One school of thought assumes hypnotic amnesia to be an involuntary process which operates without a subject's conscious control (Kihlstrom 1985;1986). A second approach holds that hypnotic amnesia is voluntary action where subjects... do not lose control over memory processes, but instead strive to enact the role of a hypnotized subject (Sarbin & Coe, 1972; Spanos, 1982; Spanos & Radtke, 1982; Spanos, 1992). From this perspective, hypnotic amnesia is a strategic social enactment where subjects' interpretations of, and motivations to comply with the task requirements play a central role. It is a strategic enactment rather than an automatic process (Spanos, 1982; 1986; 1992; Spanos, Cobb, & Gorassini, 1985; Spanos, Radtke & Dubreuil, 1982).

In viewing hypnotic amnesia as an involuntary process (Beahrs, 1986; Evans and Kihlstrom (1973) suggested that subjects suffer a deficit in recall because they are temporarily unable to organize the critical items in memory. Hence, this disorganized recall reflects an automatic disruption in memory retrieval processes or a hypnotically induced dissociation between cognitive subsystems that interfere with efficient recall (Kihlstorm, 1978; 1980; 1986; Kihlstrom & Shor, 1978). In fact, it was Evans and Kihlstrom's (1973) contention that disorganized recall was a 'defining characteristic' of

hypnotic amnesia.

However, investigators who hold the alternative strategic enactment hypothesis postulated that disorganized recall resulted from inattention to the task of recall (Spanos et al, 1980; Spanos & D'Eon, 1980; Spanos, James & de Groot, 1990; St. Jean & Coe, 1981). Furthermore, Spanos and D'Eon (1980) found support for this hypothesis by testing non-hypnotic subjects who engaged in an attention diversion task while simultaneously attempting to recall. These non-hypnotic subjects undergoing distraction showed as much disorganization as hypnotically amnesic subjects. In short, this study exemplifies the social psychological perspective on hypnosis, where recall patterns depend upon the specific task requirements of the amnesia suggestion (Spanos,1990).

In a further effort to buttress the hypothesis that hypnotically amnesic subjects lose voluntary control over memory processes, Kihlstrom et al (1980;1986) referred to studies on the breaching of amnesia. Breaching procedures involve exposing hypnotically amnesic subjects to various experimental manipulations designed to reduce amnesia. For instance, subjects might be urged to be honest about recall or to try to do their best to remember or they might be told that they are attached to a lie detector during recall (Dubreuil, Spanos, & Bertrand, 1983; Kihlstrom, Evans, Orne & Orne, 1980). The results of

these manipulations have been mixed. Nevertheless at least some of the high susceptible subjects in all of these breaching studies continued to show some amnesia in spite of being exposed to breaching manipulations. Kihlstrom et al (1980) suggested that these results demonstrated that subjects who failed to breach amnesia (increase recall) had lost control of memory and were unable to resist the amnesic effects induced by the suggestions. He added that hypnotic amnesia occurred because of a dissociation of memories from conscious control.

Spanos, Radtke, & Bertrand (1984) suggested instead that failure to breach among high susceptibles even in the face of honesty instructions is congruent with the self presentation of these subjects as deeply hypnotized. Spanos, Radtke, & Bertrand (1984) tested highly susceptible subjects who failed to breach amnesia despite repeated challenges to be honest. Every one of these subjects breached amnesia easily and completely when breaching was defined to them as supportive of a self-presentation as deeply hypnotized. Hypnotically amnesic subjects had lost control of their memory processes. On the contrary, these subjects were clearly able to initiate and terminate recall strategically in conformance with the particular social demands that constituted the amnesia testing situation (Spanos, 1982; Spanos, Cobb & Gorassini, 1985; Spanos & Radtke, 1982).

In view of the fact that a defining characteristic of hypnotic amnesia is its reversibility, it therefore involves the act of remembering. Information stored in memory may reveal itself in a variety of ways. For example, a person may recall some prior experience but only after receiving some general hints about what must be remembered or may recognize the previously experienced event only when specifically reminded of it. Recall and recognition are of special interest in this research area because some theorists have suggested that hypnotic amnesia affects recall while failing to effect recognition (Evans & Kihlstrom, 1973; Kihlstrom & Shor, 1978; Tulving, 1993).

One influential contemporary analysis of recall and recognition holds that recall involves two 'stages' while recognition involves only one (Anderson & Bower, 1972; 1974; Kintsch, 1970; Kirsch, 1992). This formulation holds that recall involves two independent processes: retrieval and decision; whereas recognition involves the decision element only. Recognition is therefore considered a subprocess of recall (Kihlstrom & Shor, 1978; Reed, 1979).

Another view of recall and recognition was presented by Tulving (1976). His view is associated with the episodic memory approach which is defined as "... the process by which information stored in a specific memory trace is utilized by the system to produce conscious

✓

memory of certain aspects of the original event... (p.40)" (Reed, 1979). The theory holds that recall and recognition represents basically similar processes, that is, either recall or recognition (remembering) reflect the interaction among trace information, resultant encoding, and retrieval information. Recall and recognition differ only with respect to the nature of the available retrieval information (Kihlstrom & Shor, 1978; Reed, 1979; Tulving, 1993).

Posthypnotic amnesia studies have assessed both recall and recognition memory. In a study by Williamsen, Johnson, and Eriksen (1965), hypnotic subjects were taught a list of words and then administered a suggestion for posthypnotic amnesia. After receiving a wake-up signal, subjects showed almost a complete failure to recall the critical words. However, later in the session the hypnotic subjects were administered a recognition task. The list contained six critical items (previously learned) and six distractors (not learned). In spite of their initial failure to recall, the amnesia subjects showed considerable recognition. The recognition memory of the deeply hypnotized subjects was, however, more impaired than that of the waking control subjects. Barber and Calverley (1966) replicated and extended the study by Williamsen et al.

Kihlstrom and Shor (1978) re-investigated the effects of post-hypnotic amnesia on recall and

recognition. They found that subjects showed a clear recall deficit during amnesia suggestion and enhanced recovery of the unrecalled memories after the suggestion was cancelled. However, amnesia was entirely abolished by recognition testing during the amnesia suggestion. In short, during posthypnotic amnesia, recall is much more seriously impaired than recognition. According to Kihlstrom and Shor (1978), these findings suggest that recognition compensates for something that is missing in the situation of ordinary free recall.

Kihlstrom and Shor (1978) interpreted their findings in terms of the Two-stage theory advocated by Anderson and Bower (1972, 1974). According to this theory, recognition obviates search. Therefore, the finding that recognition testing abolishes posthypnotic amnesia suggest that the locus of memory impairment lies in the search process rather than in the decision process. This conclusion seems consistent with those of other studies which have shown posthypnotic amnesia to be characterized by disorganized recall (Evans & Kihlstrom, 1973; Kihlstrom & Shor, 1978; Spanos & Bodorik, 1977; Spanos & D'Eon, 1980). However, a serious difficulty with this interpretation arises because it predicts no disruption in recognition. Nevertheless, these studies by Bertrand & Spanos (1990), Williamsen et al (1965), and Barber and Calverley (1966), and St. Jean and Coe (1981) have shown appreciable recognition failure. Because of these

considerations the Two-stage theory of hypnotic amnesia was abandoned and theoretical underpinnings were sought in the view proposed by Tulving (1976). It is argue that compared to ordinary free recall, the query in recognition testing provides a relatively great amount of information concerning the target material stored in memory. Thus, recognition testing maximizes the potential overlap between query and trace (Kihlstrom & Shor, 1978; Kihlstrom, 1985). The failure of recall in posthypnotic amnesia and the relative success of recognition, suggest that the amnesic subject can seem to self-generate the required cues. Kihlstrom, therefore suggested that it would be more useful to think in terms of lack of overlap between query and trace information as suggested by the episodic ecphory view of Tulving (1976) (Kihlstrom & Evans, 1979). This proposal seems to be in concert with that proposed by Spanos and Radtkke-Bodorik (1980) and Spanos et al. (1980). These investigators suggested that their findings be construed in terms of Tulving's encoding specificity principle (Tulving and Thomson, 1973). It has been postulated that recall and recognition involve the same basic process with the only difference being that a recognition task usually provides a greater overlap of encoding and retrieval cues. Therefore, the similarity observed in recall and recognition would fit better with the encoding-specificity model than the search-decision model (Spanos et al, 1980; Tulving, 1993).

EPISODIC AND SEMANTIC MEMORY

In an attempt to unravel the underlying mechanism of hypnotic amnesia, Kihlstrom proposed an interpretation which distinguishes between episodic and semantic memory as articulated by Tulving (1972).

Tulving (1972;1993) has distinguished between episodic and semantic memory. The episodic component of memory "... receives and stores information about temporally dated episodes or events, and temporal-spatial relations among these events, (p. 386)." Meanwhile, semantic memory is conceived as the memory necessary for language. It is "...organized knowledge a person has about words and other verbal symbols, their meaning and referents, about relations among them and about rules, formula(e) and algorithms for the manipulation of these symbols, concepts, and relations (p.386)." (Tulving, 1972). It is suggested that the episodic store is probably quite susceptible to transformation and loss of information; therefore, it is possible for the episodic system to operate relatively independently of the semantic system. Episodic memory may be conceived as "... a more or less faithful record about the experiences." It represents information about the experienced occurrence of an event (Kihlstrom & Evans, 1979; Tulving, 1972; 1993).

Kihlstrom and Evans (1979) cited the findings of Williamsen et al (1965) as providing support for their hypothesis that hypnotic amnesia involves a dissociation between episodic and semantic memory. In Williamsen et al (1965) study, free recall was disrupted in posthypnotic amnesia. Nevertheless these amnesic subjects gave critical words as free associates to the stimulus as quickly and as often as waking controls. Kihlstrom interpreted these findings to mean that amnesia affects the subjects' episodic memory for recent learning experiences but does not disrupt the network of association in which the critical items were embedded in semantic memory (Kihlstrom, 1980; Kihlstrom & Evans, 1979; Kihlstrom & Shor, 1978).

In a recent study, Kihlstrom (1980) reported that posthypnotic amnesia seems to represent a temporary dissociation of episodic features from memory such that the subject has difficulty reconstructing the context in which the critical events occurred. In this study, subjects were taught a list of words and then administered a posthypnotic suggestion to forget the words. Highly susceptible subjects showed substantial amnesia when challenged to recall; that is, subjects demonstrated poor recall on episodic memory tasks. Following the recall trial, subjects were given a word association task. Half the words on this task were selected so as to elicit the critical (learned) items as

associates while the other half elicited neutral (unlearned) items. Subjects who showed recall amnesia for critical items demonstrated no impairment on the word association task (WAT). In addition, there were no differences in response latencies for critical or neutral words. A second recall challenge was administered after the WAT and highly susceptible subjects continued to show recall amnesia for the words they had just generated as associates on the WAT. To Kihlstrom, the experiment demonstrated memory impairments on episodic but not on semantic tasks. According to Kihlstrom, the WAT assessed the semantic component of memory and for this reason was not affected by hypnotic amnesia.

Spanos, Radtke and Dubreuil (1982) replicated Kihlstrom's study, but in addition they demonstrated that both recall and WAT performance (and thus episodic and semantic memory) could be affected by hypnotic amnesia. Spanos, Radtke, and Dubreuil tested two groups of subjects. One group was given the verbatim amnesia suggestion used by Kihlstrom. The suggestion administered to the other group also called explicitly for recall amnesia but in addition, it subtly implied that amnesia would be shown on other tasks as well. The highly susceptible subjects of group one gave similar results to those obtained by Kihlstrom (1980)--recall amnesia with no impairment on the WAT. However, the high susceptibles

given the modified suggestion demonstrated impairment on both the recall task and the WAT. In summary, "... subtle changes in the experimental context determined whether hypnotic subjects showed episodic impairment ... (p.256)" (Spanos, 1982), without semantic impairments or both episodic and semantic impairment.

Based on these findings, it can be postulated that hypnotic amnesia is under voluntary control and "... subjects strive to enact the role of a hypnotized subject..." (Spanos, 1982; Spanos, Radtke, and Dubreuil, 1982) by responding to the particular demands conveyed by the wording of the amnesia suggestion (Spanos, 1992; 1986).

THE PRESENT STUDY

Kihlstrom views hypnotic amnesia as an involuntary process; an automatically occurring disruption in recall. However, he now agrees with several other investigators that posthypnotic amnesia influences both recall and recognition memory (Barber & Calverley, 1966; St. Jean & Coe, 1981; Williamsen, Johnson, and Eriksen, 1965). However, congruent findings among these investigators also indicate that during posthypnotic amnesia, recall is much more seriously impaired than recognition. These

results provide the basis for this study. Spanos, Radtke, and Dubreuil (1982) proposed that if hypnotic amnesia is a strategic enactment, then the experimental context, for example, the wording of the amnesia suggestion can determine the type of memory impairment recorded. These investigators have already demonstrated that both episodic and semantic memory are impaired when a modified amnesia suggestion is given. The present study will attempt to show that episodic memory is not affected in an invariable or unitary way during hypnotic amnesia (Bertrand & Spanos, 1990).

The study utilized a twelve (12) item list of unrelated nouns which high susceptible subjects were required to learn. The independent variable was group assignment where each group received a different amnesia suggestion. All high susceptibles were assessed on both recall and recognition tasks. It is expected that the high susceptible subjects would show recall and recognition deficits of varying magnitudes depending on group assignment. The first group was informed that they would have difficulty recalling the items but would have no difficulty recognizing them. The second group was given the opposite instructions. Namely that they would be unable to recognize the items but would have no difficulty recalling them. The third group was instructed that they would have equal difficulty with the recall and

recognition task, that is, they would be unable to either recall or recognize the items. The fourth group was informed that they would be unable to remember any of the items, but neither recall nor recognition would be specifically mentioned. The group four subjects would be expected to demonstrate more recall amnesia and recognition amnesia since remembering is implicitly associated with recall rather than with recognition. Thus, this study would be expected to demonstrate that the specific types of memory impairment experienced during hypnotic amnesia may be related to the subject's interpretations of, and motivation to comply with the particular task requirements of the test situation, in this case the wording of the amnesia suggestion (Spanos, 1982; 1992; Spanos, 1992; Spanos & Bodorik, 1977; Spanos & D'Eon, 1980; Spanos, James & de Groot, 1990).

METHOD

Subjects

Sixty Carleton University undergraduates who have been administered the Carleton University Responsiveness to Suggestion Scale (CURSS) (Spanos, Radtke, Hodgins, Stam, and Bertrand, 1983) were selected to participate in a one-session experiment on the effects of hypnosis on memory. The criterion for subject selection included a score in the upper range (4-7) on the objective dimension of the CURSS and passing the amnesia suggestion on the CURSS. All subjects received course credit or \$ 5.00 for participation.

Design

The study was designed as 4 x 2 mixed factorial with four between subjects variables (group assignment as determined by the wording of the amnesia suggestion) and two within subjects variables (the recall amnesia score and the recognition amnesia score). Each subject within each of the four independent groups was tested on both recall amnesia and recognition amnesia.

Stimulus Material

Subjects were required to learn a twelve (12) item list consisting of unrelated nouns taken from the norms of Palermo and Jenkins (1964) (see Appendix A).

Recall amnesia was assessed as the number of words correctly recalled after amnesia was cancelled minus the number of words recalled during the amnesia trial.

The stimulus material used in the recognition task consisted of twenty-four (24) nouns per trial. Each list contained the twelve previously learned nouns plus twelve (12) new words also drawn from the norms of Palermo and Jenkins (1964) (see Appendix B). There were three (3) recognition trials. Each of these trials included presentation of the twelve (12) old words. However, the twelve (12) new words were different on each recognition trial.

Each 'NEW' noun presented on a recognition trial was chosen as a close associate of a corresponding 'OLD' word. In other words, for each 'OLD' word the three (3) close noun associates of that word were chosen as 'NEW' distractors. The three (3) 'NEW' nouns associated with each 'OLD' word were randomly assigned to each recognition trial. A recognition amnesia score was measured as the number of words recognized after cancellation minus the number of words recognized during the amnesia trial.

Procedure

All subjects were tested individually by the same female experimenter. At the beginning of the experimental session, all subjects were randomly assigned to one of four treatment groups. Each group was in turn tested on the twelve-word list.

The experimental procedure was divided into three stages: the learning stage, the amnesia stage, the post-amnesia stage. All subjects were administered a standardized tape-recorded, 10 minute hypnotic induction procedure prior to the learning phase. This procedure had been modified from Barber (1969) (see Appendix C).

During the learning stage, the subjects were given standard free-recall instructions informing them that a list of words would be presented via a tape recording and that following each presentation they should try to recall as many words as they could. A recall period of 1 minute was allowed after each list presentation. The words were presented in the same random order on each trial and the list presentations continued until the subject reached a learning criterion of two successive correct recall trials. Following the last recall trial (S1), the first recognition trial (R1) was given. Subjects were administered a typed list which consisted of the twelve (12) previously learned 'OLD' words randomly interspersed with the twelve 'NEW' words.

Subjects were instructed to check off all the 'OLD' words but none of the 'NEW' words on the sheet. They were also instructed to number the old words in their order of presentation.

After achieving the learning criterion, all subjects received an amnesia suggestion that instructed them that they were unable to remember the previously learned words until the experimenter cancelled the amnesia suggestion with a prearranged cue. The wording of the amnesia suggestion differed for each of the four groups (see Appendices D,E,F,G). The amnesia suggestion that was given to group I subjects informed them that they would have more difficulty recalling than recognizing the old words; group II subjects were informed that they would have more difficulty recognizing than recalling; group III subjects were informed that they would have equal difficulty with both tasks, that is, they would neither be able to recall the words nor recognize the words; group IV subjects received no specific instructions about the relative difficulty of one task or the other, that is, they would be unable to remember the list words.

After administration of the particular amnesia suggestion, subjects' were challenged to recall (S2). Following the one minute recall trial, the second recognition task (R2) was administered.

Amnesia was then cancelled via the pre-arranged cue, and a post-amnesia recall (S3) and recognition (R3) trial followed. On completion of the recognition trial, subjects were administered wake-up instructions, debriefed, provided their course credit, and dismissed.

RESULTS

Determination of Recall and Recognition scores

The recall amnesia score (0-12) was assessed as the number of words not recalled during the amnesia recall trial that were correctly recalled after amnesia cancellation. A score of 12 represent total recall amnesia.

The recognition amnesia score was defined as the difference between the number of old words correctly identified after amnesia cancellation and the number of old words correctly identified during the amnesia trial.

Recall and Recognition Amnesia

To examine the degree of recall and recognition amnesia for the four groups across the two trials, a 4 x 2 mixed Anova with one between subjects variable (suggestion type) and one within subjects variable (recall and recognition trials) was conducted on the amnesia scores. The means and standard deviations for recall amnesia and recognition amnesia are presented in Table I. The summary table for the analysis is given in Table II.

Table I

Means and Standard Deviations for
Recall and Recognition Amnesia Scores
for the four Suggestion Types

Suggestion Types	Recall Amnesia Scores	Recognition Amnesia Scores
Type I	M 6.73 ¹ _b sd 4.95	M 1.53 ² _a sd 3.07
Type II	M 2.80 ¹ _a sd 3.43	M 3.20 ¹ _{ab} sd 3.95
Type III	M 4.73 ¹ _{ab} sd 2.99	M 3.20 ¹ _{ab} sd 3.34
Type IV	M 5.33 ¹ _{ab} sd 4.22	M 5.13 ¹ _b sd 4.03

Note. For all means, $n = 15$. Within a column, means sharing a common letter subscript fail to differ significantly at $p < .05$. Within a row, means sharing a common superscript number fail to differ significantly at $p < .10$. (I = more recall amnesia than recognition amnesia; II = more recognition amnesia than recall; III = to be neither able to recall nor recognize; IV = can't remember.)

Table II

Summary table for Suggestion Type by Trials
ANOVA on Amnesia Scores

Source	df	SS	MS	F
Suggestion Type (A)	3	75.37	25.12	1.04
subjects within groups	56	1350.8	24.12	
Trials (B)	1	80.03	80.03	16.91*
AxB	3	141.90	47.30	9.99*
BxSs	56	265.07	4.73	

* $p < .05$

The main effect for suggestion type failed to reach significance, $F(3,56) = 1.04$. However, the main effect for the recall/recognition trials did attain significance $F(1,56) = 16.91$, $p < .05$ and the interaction of Suggestion type by trials also attained significance, $F(3,56) = 9.99$, $p < .05$.

The interaction was further explored with a series of simple main effects analyses (see Table III). The between subjects simple main effects indicated significant differences between suggestion types on the Recall Amnesia trial, $F(3,77) = 2.76$, $p < .05$. A trend towards significance between suggestion types emerged on the Recognition Amnesia trial, $F(3,77) = 2.25$, $p < .10$.

Post hoc analysis (L.S.D) conducted on the Recall Trial scores indicated that subjects given Suggestion Type 1 calling for more recall amnesia than recognition amnesia exhibited higher levels of recall amnesia than subjects given Suggestion Type 2 which suggested more recognition amnesia than recall amnesia. No other differences attained significance.

In addition, post-hoc analysis conducted on the recognition trial scores indicated that the subjects given Suggestion Type 1 implying more recall amnesia than recognition amnesia, exhibited lower recognition amnesia

than those subjects given Suggestion Type 4 which stated that the subjects could not remember. In other words, subjects who received the suggestion "you can't remember" showed significantly higher recognition amnesia than those who were told they would have more difficulty recalling than recognizing the words. No other differences attained significance. The within subjects simple main effects of trials for subjects in the group who received Suggestion Type 1 calling for more recall amnesia than recognition amnesia attained significance, $F(1,56) = 42.85$, $p < .05$, (see Table III). Subjects given the Suggestion for more recall than recognition amnesia (Type 1) exhibited higher levels of recall amnesia than recognition amnesia. There were no significant differences between recall and recognition amnesia for subjects who received Suggestion Type 2 which implied more recognition amnesia than recall amnesia, $F(1,56) < 1$; Suggestion Type 3 which told subjects that they would be unable to recall or recognize the words, $F(1,56) = 3.73$; and Suggestion Type 4 which indicated that they would not be able to remember the words, $F(1,56) < 1$.

Table III

Summary Table of Simple Effects for Suggestion Type
by Trial

Source	SS	df	MS	F
A @ B1	119.8	3	39.90	2.76*
A @ B2	97.46	3	32.49	2.25**
B @ A1	202.77	1	202.77	42.85*
B @ A2	1.20	1	1.20	0.25
B @ A3	17.64	1	17.64	3.73
B @ A4	0.30	1	0.30	0.06

* $p < .05$ ** $p < .10$

In addition, a chi-square test was used to determine how Suggestion Type was related to the number of subjects showing Recall and Recognition amnesia (see Table IV). The number of subjects were divided into those showing as much or more Recognition than Recall amnesia and those showing higher Recall than Recognition amnesia. These were compared as a function of the varying Suggestion Types.

The obtained value of X^2 was 4.92, $p < .05$ for the Suggestion Type 1 (more recall amnesia than recognition amnesia) versus Suggestion Type 2 (more recognition amnesia than recall amnesia); and $X^2 = 10.38$, $p < .05$ for Suggestion Type 3 (subjects were told they would be unable to either recall or recognize the words) versus Suggestion Type 2 (subjects were told they would experience more recall amnesia than recognition amnesia for the words). These results indicated higher recall amnesia scores for Suggestion Type 1 and Suggestion type 3 when compared to Suggestion Type 2 which implies more recognition amnesia than recall amnesia. Conversely, Suggestion Type 2 in both comparisons produced higher recognition amnesia scores than Suggestion Type 1 (more recall amnesia than recognition amnesia) or Suggestion Type 3 (unable to either recall or recognize).

However, when Suggestion Type 4 was compared to Suggestion Type 2 the obtained X^2 value was 0.159 (see Table IV). This result demonstrated that the non-specific

Suggestion Type 4 (can't remember) produced no significant differences in the amount of Recall or Recognition amnesia when compared to Suggestion Type 2 (more recognition than recall amnesia).

In the final comparison, the number of subjects showing as much or more recognition than recall amnesia and those showing higher recall than recognition amnesia were combined for Suggestion Types 1,3,4 and compared to Suggestion Type 2 (see Table IV). The obtained value of χ^2 was 5.01, $p < .05$. When the numbers of subjects from the three Suggestion Types 1,3,4 were combined and compared to Suggestion Type 2, the result was a higher level of recall amnesia for the the combined Suggestion types versus Suggestion Type 2. Also a higher level of Recognition amnesia for the combined Suggestion Types was noted as would be expected when the subjects for each Suggestion Type were combined.

When subjects were told they would exhibit more recall amnesia than recognition amnesia--Type 1 Suggestion--the results showed significantly higher recall amnesia than recognition amnesia. Although no other significant differences were obtained, these data demonstrated a tendency for the subjects given Suggestion Type 3 (unable to either recall or recognize) and Suggestion Type 4 (can't remember) to show higher recall amnesia than recognition amnesia.

TABLE IV

Frequency of Recall and Recognition amnesia
for each Suggestion type.

Suggestion Type	More Recall	As Much as or More Recognition	N	χ^2	$p <$
Type 1	10	5	15		
Type 2	4	11	15	4.92	.05
Type 3	12	3	15		
Type 2	4	11	15	10.38	.05
Type 4	5	10	15		
Type 2	4	11	15	0.159	.05
Type 1,3 & 4 combined	27	18	45		
Type 2	4	11	15	5.01	.05

Note. χ critical = 3.84, $p < .05$

Correlation Analyses

Further analyses using Pearson correlations were conducted. The correlation coefficients among and between the CURSS objective (O), Subjective (S), Involuntariness (OI) scores and the amnesia scores (recall and recognition) for each suggestion type are illustrated in tables V, VI, VII, VIII. A moderate correlation was noted for the correlation between recall and recognition amnesia scores for suggestion Type 1, $r = .39$. A moderate to high coefficient was obtained for the correlation between the recall and recognition amnesia scores for suggestion Type 2. For both suggestion Types 3 and 4, very high Pearson correlation coefficients were obtained, $r = .88$, and $r = .96$ respectively.

Amnesia scores for Suggestion Type 1 and 2 were combined and amnesia scores for Suggestion Type 3 and 4 were also combined, then the correlation coefficients between the CURSS O, S, OI scores and these combined scores were obtained, as illustrated in tables IX and X. The correlation coefficient between the recall and recognition amnesia scores for the combined scores of Suggestion Type 1 and Type 2 proved to be lower ($r = .29$) than that for either Suggestion Type obtained separately. Suggestion Type 1 represented the specific task to the subject of displaying more recall amnesia than recognition amnesia whereas Suggestion Type 2 represented

the reverse task of showing more recognition amnesia than recall amnesia. This relatively low correlation coefficient, $r = .29$, could be attributed to the differences in the amnesia instructions as determined by the suggestion type.

On the other hand, the correlation coefficient for the combination amnesia score of Suggestion Type 3 and 4 versus the CURSS scores was very high, $r = .92$. This high correlation of Recall amnesia and Recognition amnesia for the combination of Type 3 and Type 4 indicated no significant differences between the recall and recognition amnesia scores for the two non-specific suggestion types. Suggestion Type 3 instructed the subjects that they would be unable to either recall or recognize the learned words, while Suggestion Type 4 instructed them that they could not remember the learned words. In other words, the subjects interpreted no significant difference between the Suggestion Type 3 and Type 4, thus exhibiting goal directed behavior.

On further examination, the differences between these correlation coefficients were tested for significance as represented in Table XI. Using the Fisher Z_r transformation the combined Type 3 and 4 (represented by A) was tested against the combined Type 1 and 2 (represented by B). The obtained value of $Z_r = 4.74$, $p < .05$. Similarly, combined Type 3 and Type 4

(A) was tested against Type 1 (C) and the obtained value of $Z_r = 3.39$, $p < .05$; the combined Type 3 and Type 4 (A) was in turn tested against Type 2 (D) and the obtained value of $Z_r = 2.71$, $p < .05$. These significant differences indicated that the manipulation of suggestion type (namely the wording of the amnesia suggestion) determined the correlation and thus the differences between the recall and recognition amnesia scores. In other words, the wording of the amnesia suggestion type influenced the amount and the type of amnesia experienced.

TABLE V

Pearson Coefficients Between the CURSS
and Amnesia Scores for Suggestion Type I

	CURSS:O	CURSS:S	CURSS:OI	Recall	Recognition
CURSS:O		0.33	0.70	0.46	0.33
CURSS:S			0.25	0.58	0.34
CURSS:OI				0.43	-0.11
Recall					0.39
Recognition					

Note. $n = 15$, $p < .05$.

TABLE VI

Pearson Coefficients Between the CURSS
and Amnesia Scores for Suggestion Type 2

	CURSS:O	CURSS:S	CURSS:OI	Recall	Recognition
CURSS:O		0.17	0.53	0.23	0.20
CURSS:S			0.36	0.03	0.21
CURSS:OI				-0.10	0.44
Recall					0.57
Recognition					

Note. $n = 15$, $p < .05$.

TABLE VII

Pearson Coefficients Between the CURSS
and Amnesia Scores for Suggestion Type 3

	CURSS:O	CURSS:S	CURSS:OI	Recall	Recognition
CURSS:O		0.16	0.39	0.26	0.49
CURSS:S			0.75	0.48	0.46
CURSS:OI				0.67	0.70
Recall					0.88
Recognition					

Note. $n = 15$, $p < .05$.

TABLE VIII

**Pearson Coefficients Between the CURSS
and Amnesia Scores for Suggestion Type 4**

	CURSS:O	CURSS:S	CURSS:OI	Recall	Recognition
CURSS:O		0.80	0.79	0.59	0.51
CURSS:S			0.85	0.34	0.29
CURSS:OI				0.49	0.43
Recall					0.96
Recognition					

Note. $n = 15$, $p < .05$.

TABLE IX

Pearson Coefficients Between the CURSS and Amnesia
Scores for Suggestion Type 1 and Type 2 combined.

	CURSS:O	CURSS:S	CURSS:OI	Recall	Recognition
CURSS:O		0.27	0.61	0.38	0.20
CURSS:S			0.29	0.42	0.23
CURSS:OI				0.30	0.10
Recall					0.29
Recognition					

Note. $n = 30$, $p < .05$.

TABLE X

Pearson Coefficients Between the CURSS and Amnesia Scores for Suggestion Type 3 and Type 4 combined.

	CURSS:O	CURSS:S	CURSS:OI	Recall	Recognition
CURSS:O		0.43	0.58	0.39	0.35
CURSS:S			0.79	0.38	0.34
CURSS:OI				0.54	0.51
Recall					0.92
Recognition					

Note. $n = 30$, $p < .05$.

TABLE XI

Test of the Significance of the differences between the correlation between Recall and Recognition for specific combinations of the Suggestion types.

Suggestion Type	r	r'	N	Z _r	p <
A	0.92	1.589	30		
B	0.29	0.299	30	4.74	.05
A	0.92	1.589	30		
C	0.39	0.412	15	3.39	.05
A	0.92	1.589	30		
D	0.57	0.648	15	2.71	.05

Note. Critical Z_r = ± 1.96 , two tailed. A represents the combination of suggestion types 3 and 4; B represents the combination of suggestion types 1 and 2; C represents suggestion type I; D represents suggestion type 2. r' is obtained from conversion tables used in the Fisher Z_r transformation.

DISCUSSION

This study demonstrated a marked relationship between the Suggestion Types and the Recall and Recognition amnesia scores. For the Recall trial, a significant difference between Suggestion Type 1 and Suggestion Type 2 was seen. When subjects were directed to demonstrate either more recall amnesia than recognition amnesia (TYPE 1) or more recognition amnesia than recall amnesia (TYPE 2), they showed compliance with the suggestion by exhibiting significantly higher recall amnesia than recognition amnesia as determined by the wording of Suggestion Type 1.

For the Recognition trial, subjects who received Suggestion Type 1 showed a significant difference from those who received Suggestion Type 4. Subjects who were told that they would have difficulty remembering the learned words (TYPE 4) showed a significantly higher level of recognition amnesia than those who were told that they would have more difficulty recalling the words than recognizing them (TYPE 1). Subjects who received Suggestion Type 1 demonstrated a tendency to reduce their recognition amnesia score.

Furthermore, subjects given Suggestion Type 2 calling for more recognition amnesia than recall amnesia

did demonstrate a tendency to higher degree of recognition amnesia. However, when the suggestion type specifically called for more recall than recognition amnesia (TYPE 1) or in the cases where the suggestion types were non-specific as in "you will be unable to either recall or recognize the words" (TYPE 3) and "you can't remember" (TYPE 4), subjects demonstrated higher levels of Recall amnesia than Recognition amnesia.

The results of the investigation demonstrated that episodic memory was not affected in any consistent way during hypnotic amnesia, i.e., episodic memory deficits are achievable on both Recall and Recognition tasks by varying or modifying the wording of the amnesia suggestion. Furthermore hypnotic amnesia not only affects a subject's ability to recall a previously learned list of words but also affects their ability to recognize the same items when combined with close associate distractors. These results are supported by several other studies evaluating the process underlying hypnotic amnesia (Bertrand & Spanos, 1990; Perlini, Bertrand, Spanos, 1988; Spanos, 1986; Spanos, Cobb & Gorassini, 1985; Spanos, Stam, D'Eon, Pawlak, & Radtke-Bodorik, 1980; Spanos & Bodorik, 1977; St. Jean & Coe, 1981).

Spanos, Radtke & Bertrand, (1984) and Spanos, Radtke, & Dubreuil, (1982) showed that 1) high

susceptible hypnotic subjects failed to breach amnesia in order to maintain themselves as "good" hypnotic subjects who retain control over their memory processes, and 2) subjects can be induced to show either episodic without semantic impairments or both episodic and semantic disruption.

However, these findings are in direct contrast to claims made by Kihlstrom (1980). Kihlstrom, a special-process theorist, believes that behavior under hypnosis is produced by a qualitatively different process than the same behavior exhibited under non-hypnotic conditions. He views hypnotic amnesia as an inability to retrieve target material in which highly responsive hypnotic subjects act as if something is happening to them outside of their control rather than as something that they are doing themselves. This is the traditional way in which most hypnotic behavior has been interpreted (e.g. see Underwood, 1986).

The special-process theory holds that amnesia involves the dissociation of target memories from conscious control, thus they cannot be accessed voluntarily (Kihlstrom, 1978; 1980; 1985; 1986; Kihlstrom & Evans, 1976; Kihlstrom, Evans, Orne & Orne 1980; Kihlstrom & Shor, 1978). Kihlstrom (1980) argues that hypnotic amnesia is an involuntary phenomenon and that

its occurrence requires a dissociative capacity, i.e., a temporary dissociation between episodic and semantic memory. He argued further that posthypnotic amnesia is characterized by a disruption in some aspects of the organization of recall. Kihlstrom contends that subjects can be induced to show only episodic but not semantic impairment in memory since semantic memory represents knowledge that is independent of specific contexts. According to this perspective (Kihlstrom, 1980; Underwood, 1986) hypnotically amnesic subjects would be unable to recall target material and are unable to generate retrieval cues that would reinstate recall (Kihlstrom & Shor, 1978).

The social-psychological perspective on hypnotic amnesia assumes the goal-directedness of hypnotic amnesia and its dependence on subjects' interpretations and motivations to comply with the particular task requirement of the test situation. On this view, hypnotic amnesia does not reflect a loss in the ability to control memory nor is it a special "state" (Bertrand & Spanos, 1990; 1986; 1985; St. Jean & Coe, 1981; Spanos, 1992; 1986; 1982;) but rather it is a strategic social behavior similar to other forms of social behavior.

According to Spanos and supporters of the response-strategy view, hypnotic amnesia is characterized by the subjects' understanding of the task requirement. Hypnotically amnesic subjects do not consistently follow the target related retrieval cues during the amnesic suggestion. After cancellation of the suggestion the subjects refocus attention on the retrieval cues and recall the forgotten information (Dubreuil, Spanos & Bertrand, 1982; Kirsch, 1986; Spanos, 1986). In addition, amnesic suggestions often provide ambiguous or conflicting messages and the individual differences reported in response to these suggestions reflect varying interpretations of these contextual demands.

St.Jean & Coe (1981) found additional support for the contention that hypnotic subjects are actively involved in tactics that help prevent them from remembering, such as, shifts in attention during the amnesia period as similarly demonstrated by Spanos & D'Eon (1980). During the amnesia test situation, it is important to emphasize that the demands of the test situation require temporary forgetting of the target material. In order to comply with the demands of the situation subjects may temporarily shift their attention away from the retrieval cues associated with the target material until it becomes appropriate to refocus. This

shift in attention decreases the accessibility of the learned items. This behavior conforms to the role of being a 'good' hypnotic subject where subjects must adapt their cognitive strategy to meet the requirements of the test situation. Furthermore, the degree of amnesia is dependant on the interaction between the neglected retrieval cues and the subjects preferred memory strategy (Spanos & Bodorik, 1977; Spanos et al, 1980).

This non-state interpretation is based on Tulving's (1972, 1993) encoding specificity model of memory which states that recall will be successful to the extent that the retrieval cues were associated with the target material at the time of encoding. Tulving and his colleagues have shown in studies of encoding specificity in retrieval that words learned in the context of particular verbal cues may not be recognized when subsequently presented in the context of other verbal cues (Tulving, 1993). The model explains that although recall and recognition may involve the same basic process, a recognition task would provide a greater overlap of encoding and retrieval cues.

Although Spanos and Kihlstrom hold opposing views on the underlying principle of hypnosis and hypnotic amnesia, they both rely on Tulving's (1976) distinction between episodic and semantic memory to explain the role of retrieval cues in hypnotically induced recall and

recognition amnesia. The non-state or cognitive social-psychological view argues that the subject is in control of the retrieval cues while the special "state" proponents contend that the subject has loss control of the ability to access the retrieval cues.

The proponents of the social psychological perspective view hypnotic amnesia as attentional shifts away from the target material i.e. a conscious effort is made to *disattend from the retrieval cues* that are present at the time of the amnesic challenge. Although they experienced both episodic recall and recognition amnesia, the critical material could still be accessed as required. On this view, hypnotic subjects retain control over their memory processes thus being able to accommodate their ability to recall and/or to recognize a previously learned list of words to the implicit and explicit demands of the test situation.

In the present research we found for all four suggestion types that some subjects displayed recognition amnesia to some degree although not necessarily at the same level as that noted for the recall amnesia scores. (see also Bertrand & Spanos, 1990, and St. Jean & Coe, 1981).

Kihlstrom (1980) argue that hypnotic amnesia and organic amnesia share important "phenotypic" similarities

and might wish to interpret the present data in this light. However, the most obvious difference between hypnotic and organic amnesia resides in the fact that hypnotic amnesia which is elicited by verbal cues, is easily and completely terminated by pre-arranged verbal cues while organic amnesia, caused by damage to the central nervous system, is not necessarily reversible and certainly not reversible by such simple means. Hypnotically amnesic subjects can recall the critical material following cancellation indicating that the material has not been permanently forgotten as in the case of organic amnesia.

A second important difference between the two types of amnesia stems from the fact that hypnotic amnesia affects only specifically suggested past events and not new material. Organic amnesia may produce deficits for both previously learned material as well as new material and is non-specific in nature (Bertrand, Spanos and Radtke, 1990; Kihlstrom, 1986).

A third difference lies in the fact that hypnotically amnesic subjects who obtain high recall amnesia scores frequently obtain lower recognition amnesia scores (see Barber & Calverley, 1966; Kihlstrom & Shor, 1976; St. Jean & Coe, 1981; Williamsen et al, 1965). Patients suffering from organic amnesia typically exhibit almost total recognition amnesia as well as

recall deficits; such a pattern further indicates the dissimilarities between hypnotic and organic amnesia.

According to the dissociation position, subjects should show deficits on both episodic tasks (recall and recognition). However, the deficits obtained were totally suggestion specific (more recall or recognition as called for by the particular wording of the amnesic suggestion), i.e., a dissociation between two episodic tasks, a finding that could not predicted by a dissociation hypothesis (Bertrand, Spanos & Radtke, 1990; Spanos, Cobb & Gorassini, 1985; Spanos & Radtke, 1982).

Kihlstrom might also wish to postulate the occurrence of a type of agnosia. This is when subjects are no longer able to understand the meaning of amnesic material. He used this argument (Kihlstrom, 1985) to explain the results of the study by Spanos et al. (1982) and could presumably postulate the same type of interpretation for this study. This would amount to arguing that memory processes are not under a subject's voluntary control, that subjects would lose the ability to comprehend amnesic material in situation defined as hypnosis. Kihlstrom believes an automatically occurring dissociation between the episodic and semantic components of memory is an intrinsic characteristic of hypnotic amnesia. Such an explanation is contrary to a large body of evidence which suggest that subjects retain voluntary

control of the appropriate processes (Bertrand & Spanos, 1986; 1985; Spanos, 1992; 1986; 1982).

In summary, the subjects' response in this study were consistent with the social psychological approach to hypnotic amnesia. Subjects exhibited a tendency to show high levels of the appropriate form of amnesia as determined by the particular amnesia suggestion. They responded in terms of their interpretation of the demands of the task (the different wording of the amnesia suggestion). This study provided further evidence that hypnotic amnesia is a strategic social enactment (purposely attending away from the retrieval cues) which is characterized by the subject's perceptions of the test situation (Bertrand & Spanos, 1990; Spanos, 1980; Spanos, Radtke, & Dubreuil, 1982). Hypnotically induced amnesics do not respond passively to a suggestion of amnesia. Hypnotic behavior is purposeful and goal-directed. The findings of this investigation validate the contention that hypnotic behavior, specifically hypnotic amnesia, is a function of a subject's interpretation of the implied expectation inherent in the wording of the amnesia suggestion. The most prudent explanation would be that the material for which amnesia is suggested remains accessible and can be retrieved as the situation deems appropriate.

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APPENDICES

APPENDIX A

12-ITEM LEARNING LIST

TABLE

RIVER

HAND

NEEDLE

DREAM

CHILD

LION

CITY

YELLOW

LIGHT

HEALTH

HAMMER

APPENDIX B

RECOGNITION LIST

R1	R2	R3
CHAIR	FOOD	DESK
WATER	STREAM	LAKE
FOOT	ARM	FINGER
THREAD	THIMBLE	PIN
SLEEP	NIGHT	WISH
BABY	MOTHER	KID
TIGER	CAT	ROAR
TOWN	COUNTRY	VILLAGE
RED	BLUE	BLACK
DARK	LAMP	SUN
SICKNESS	GOOD	HAPPY
NAIL	WOOD	SAW

APPENDIX C

Hypnotic Induction Procedure

Close your eyes. Your ability to be hypnotized depends entirely on your willingness to cooperate. It has nothing to do with your intelligence. As for your will power - if you want to, you can pay no attention to me and remain awake all the time. On the other hand, if you pay close attention to what I say, and follow what I tell you, you can easily fall into a hypnotic sleep. Hypnosis is nothing fearful or mysterious. It is merely a state of strong interest in some particular thing. In a sense you are hypnotized whenever you see a good show and forget you are part of the audience, but instead feel part of the story. Your cooperation, your interest, is what I ask for. Your ability to be hypnotized is a measure of your willingness to cooperate. Nothing will be done that will in any way cause you the least embarrassment.

Now relax and make yourself entirely comfortable. Relax completely. Relax every muscle of your body. Relax the muscles in your legs. Relax the muscles in your arms. Make yourself perfectly comfortable. Let yourself be limp. Relax more and more, more and more. Relax completely. Relax completely. Relax completely.

Your legs feel heavy and limp, heavy and limp. Your arms are heavy, heavy, heavy as lead. Your whole body feels heavy, heavier, and heavier. You feel tired and sleepy, tired and sleepy. You feel drowsy and sleepy, drowsy and sleepy. Your breathing is slow and regular, slow and regular.

You feel pleasantly drowsy and sleepy as you continue to listen to my voice. Just keep your thoughts on what I am saying. You are going to get much more drowsy and sleepy. Soon you will be deep asleep but you will have no trouble hearing me. You will not wake until I tell you to. Remember that the dangers of hypnosis are a myth. Nothing will be done that is in any way harmful to you.

I shall now begin to count. At each count you will feel yourself going down, down, down into a deep comfortable, a deep restful sleep. A sleep in which you will be able to do all sorts of things I ask you to do. One - you are going to go deeply asleep...Two - down, down into a deep, sound sleep...Three, Four - more and more, more and more asleep... Five, Six, Seven - you are sinking, sinking into a deep, deep sleep. Nothing will disturb you. Pay attention only to my voice and the things I tell you. Eight, nine ,ten - deep asleep. You will not awaken until I tell you to do so. You will wish to sleep and have the experiences that I shall presently describe.

You are feeling comfortable and relaxed, comfortable and relaxed, and you are in a deep sound sleep - a deep sound sleep - fully prepared to respond to and experience what I will ask you to do. You are feeling comfortable, relaxed, thinking of nothing, nothing but what I say, your arms and legs feel heavy, your arms and legs feel heavy and you are relaxed, relaxed, your whole body feels relaxed, your whole body feels relaxed, the muscles of your face, arms, and legs are relaxed, your whole body is relaxed. Drift deeper. It feels as though you are going backward into the darkness, backward into the darkness, and as you go backward into the darkness you are more and more relaxed, more and more comfortable. You are going backward, backward, backward into the darkness and as you go backward into the darkness you feel more and more comfortable, more and more relaxed. You are listening only to my voice, only to my voice, thinking of nothing, absolutely nothing, concentrating only on my voice, listening only to what I tell you, listening only to my voice. You are feeling comfortable and relaxed, comfortable and relaxed, and you are in a deep sound sleep, a deep sound sleep, fully prepared to respond to and experience what I shall ask you to do.

APPENDIX D

WORDING OF AMNESIA SUGGESTION FOR GROUP I

Now, please listen very carefully to what I say next. The human memory system contains both a recall component and a recognition component. Hypnotic suggestions to forget a list of words interfere with the recall component of memory much more than they interfere with the recognition component of memory. Now, the words that you just learned are disappearing from your memory. These words are fading from your memory, they are fading completely from your memory. Soon you will be unable to recall any of the list words no matter how hard you try. However, even though you will be UNABLE TO RECALL the words you will probably be able to recognize the words. Even the best hypnotic subjects are able to recognize the words that they are UNABLE TO RECALL.

You will be UNABLE TO RECALL any of the list words until you hear two knocks like this (knock twice) and the phrase "NOW YOU CAN REMEMBER EVERYTHING", until that time the words will be gone. The words will have faded completely from your memory until you hear two knocks and the phrase "NOW YOU CAN REMEMBER EVERYTHING". The words

will be completely gone so that you are UNABLE TO RECALL them no matter how hard you try, even though you CAN'T RECALL the words, you'll probably be able to recognize them. Do not be disturbed by your ability to recognize the words. It is normal and expected. The words are disappearing from your memory. They are fading more and more, fading more and more, fading more and more. The words are disappearing from your memory. They are disappearing completely from your memory so that you are completely UNABLE TO RECALL the words. They are gone, gone completely from your memory. You can no longer RECALL the words, they are gone, gone, gone completely from your memory.

APPENDIX E

WORDING OF AMNESIA SUGGESTION FOR GROUP II

Now, please listen carefully to what I say next. The human memory system contains both a recall component and a recognition component. Hypnotic suggestion to forget a list of words interfere with the recognition component of memory much more than they interfere with the recall component of memory. Now, the words that you have just learned are disappearing from your memory. These words are fading from your memory, they are fading completely from your memory. Soon you will be UNABLE TO RECOGNIZE any of the list words no matter how hard you try. However, even though you will be UNABLE TO RECOGNIZE the words you will probably be able to recall the words. Even the best hypnotic subjects are able to recall the words that they are UNABLE TO RECOGNIZE.

You will be UNABLE TO RECOGNIZE any of the list words until you hear two knocks like this (knock twice) and the phrase "NOW YOU CAN REMEMBER EVERYTHING", until that time the words will be gone. The words will have faded completely from your memory until you hear two knocks and the phrase "NOW YOU CAN REMEMBER EVERYTHING". The words will be completely gone so that you are UNABLE TO RECOGNIZE them no matter how hard you try, even though

you CAN'T RECOGNIZE the words you'll probably be able to recall them. Do not be disturbed by your ability to recall the words. It is normal and expected. The words are disappearing from your memory. They are fading more and more, fading more and more, fading more and more. The words are disappearing from your memory. They are disappearing completely from your memory so that you are completely UNABLE TO RECOGNIZE the words. They are gone, gone completely from your memory. You can no longer RECOGNIZE the words they are gone, gone, gone completely from your memory.

APPENDIX F

WORDING OF AMNESIA SUGGESTION FOR GROUP III

Now, please listen very carefully to what I say next. The words that you just learned are disappearing from your memory. These words are fading from your memory, they are fading from your memory. Soon you will be unable to RECALL or RECOGNIZE any of the list words no matter how hard you try. These words will be gone, gone completely from your memory. You will be unable either to RECALL any of these words or to RECOGNIZE any of these words until you hear two knocks like this (knock twice, and the phrase "NOW YOU CAN REMEMBER EVERYTHING", until that time the words will be gone. The words will have faded completely from your memory until you hear two knocks and the phrase "NOW YOU CAN REMEMBER EVERYTHING". The words will be completely gone. They will be completely gone so that you are unable either to RECALL any of these words or to RECOGNIZE any of these words no matter how hard you try. The words are disappearing from your memory, they are fading more and more, fading more and more, fading more and more. The words are disappearing completely from your memory so that you are completely unable to RECALL any of these words or to RECOGNIZE any of these words. They are gone, gone

completely from your memory, you can no longer RECALL any of these words or RECOGNIZE any of these words, they are gone, gone completely from your memory.

APPENDIX G

WORDING OF AMNESIA SUGGESTION FOR GROUP IV

Now, please listen very carefully to what I say next. The words that you just learned are disappearing from your memory, these words are fading from your memory, they fading completely from your memory. Soon you will be unable to remember any of the list words, no matter how hard you try. These words will be gone completely from your memory. You will be unable to remember any of the list words until you hear two knocks like this (knock twice) and the phrase "NOW YOU CAN REMEMBER EVERYTHING". Until that time the words will be gone. The words will have faded completely from your memory, until you hear two knocks and the phrase "NOW YOU CAN REMEMBER EVERYTHING", the words will be completely gone. They will be completely gone so that you are unable to remember them no matter how hard your try. The words are disappearing from your memory. They are fading more and more, fading more and more, fading more and more. The words are disappearing from your memory, they are disappearing completely from your memory so that you are unable to remember the words. They are gone, gone completely from your memory. You can no longer remember the words, they are gone, gone, gone completely from your memory.

APPENDIX E

Instructions for Recall task

Please listen carefully to what I say next. In a moment I am going to ask you to open your eyes. You will remain hypnotized but will feel alert and will be able to accomplish the tasks that I give you, quickly and easily. A short list of words will be verbally presented to you. At the end of the list, I shall give you a sheet of paper. I would like you to write down the words that were presented to you. We shall continue this procedure until you are able to remember and write down all the words that were presented to you on two successive trials. Although your eyes will be open and you will feel alert , you will remain hypnotized. Now open your eyes but remain hypnotized.

O.K., that's fine. Now please close your eyes and relax.

APPENDIX I

Instructions for Recognition task

Now, in a moment I am going to ask you to open your eyes. Although your eyes will be open, you will remain hypnotized. I shall give you a typed list of words. Some of these words were learned by you earlier in this study. What I would like you to do is to look at each word and decide if you learned it earlier. When you have made your decision, I want you to place a check mark to indicate the words that you had learned earlier. Now please open your eyes, but remain hypnotized. Look at each word and decide if you learned it earlier.

O.K., that's fine. Now close your eyes and relax.

APPENDIX J

WAKE-UP INSTRUCTIONS

You are going to wake up in a few minutes. You will feel refreshed, wide awake, and in a good mood. I shall count from five to one and with each count you will be more fully awake. Five (5) - starting to wake, four (4) - more and more awake, three (3) - still more and more awake, two (2) - becoming more and more awake, one (1) - wide awake. Open your eyes. Wide awake.

APPENDIX K

To evaluate the obtained F for the between-group simple main effects it was necessary to calculate a statistic denoted as (f) . The value of (f) is defined by Satterthwaite (1946) as

$$f = \frac{(u + v)^2}{\frac{u^2}{df_u} + \frac{v^2}{df_v}}$$

where

$$u = SS \text{ Ss within A}$$

$$v = SS \text{ B x Ss within A}$$

$$df_u = df \text{ Ss within A}$$

$$df_v = df \text{ B x Ss within A}$$

The value of (f) for this data is as follows :

$$u = 1350.80$$

$$v = 265.07$$

$$df_u = 56$$

$$df_v = 56$$

therefore $(f) = 77.2$, and rounding to the nearest integer, $f = 77$, thus the obtained F is evaluated against F 0.5 (3, 77).

END

1 5 1 1 9 5

FIN