amnesia; only the explanation varies. It has generally been assumed that items on a standardized susceptibility scale that were passed are associated with positive affect and those that were failed are associated with negative affect. According to the repression hypothesis, then, subjects ought to selectively forget failed items, whereas according to the enhancement hypothesis subjects ought to selectively remember passed items. Two studies found that low susceptible subjects selectively recalled passed items (Hilgard & Hommel, 1961; O'Connell, 1966) and one failed to find support for any selective recall hypothesis (Coe, Baugher, Krimm, & Smith, 1976).

The measure of selective recall used in most studies (i.e., Selective Recall Index [SRI]) has an inherent bias (Pettinati & Evans, 1978). High and low susceptibles differ not only on the number of items recalled during an amnesia suggestion but also on the relative number of passed versus failed items. Thus, high susceptibles pass a large proportion of the suggestions but tend to recall few of them during amnesia whereas low susceptibles pass only a small proportion of the suggestions but tend to recall many of them. As a result, the measure used is biased in the direction of providing higher scores for low susceptibles than for high susceptibles.

Pettinati and Evans (1978) compared the SRI with a new unbiased measure, the Recall Comparability Index (RCI).

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THE EFFECT OF METHODOLOGICAL FACTORS ON
HYPNOTIC AMNESIA AND DISORGANIZATION

© H. Lorraine Radtke
Carleton University
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Dissertation presented to the Faculty of Graduate Studies
in partial fulfillment of the requirements for the
degree of Doctor of Philosophy in Psychology

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The undersigned recommend to the Faculty
of Graduate Studies and Research acceptance of the thesis

"The Effect of Methodological Factors on
Hypnotic Amnesia and Disorganization

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ABSTRACT

Relationships between hypnotic amnesia and the organization of recall have been studied under two experimental paradigms; the susceptibility-scale paradigm and the word-list paradigm. In the susceptibility-scale paradigm the stimulus material has consisted of unrelated test suggestions presented for a single trial under an incidental learning set. Two types of memory organization, seriation and subjective organization, have been assessed. In the word-list paradigm the stimulus material has typically consisted of words drawn from different taxonomic categories and learned to a stringent criterion under an intentional learning set. Clustering of recall has been the type of memory organization assessed. Studies using the word-list paradigm have consistently found that partially amnesic subjects show disorganized recall. They cluster significantly less during an amnesia suggestion test period than before it or after it is cancelled. Nonamnesics (those who recall all the words despite the suggestion) do not disorganize. They continue clustering to a high degree before the suggestion, during it, and after it is cancelled. Studies employing the susceptibility-scale paradigm have yielded inconsistent findings. Several have reported results indicating reduced seriation during amnesia testing, but others have failed to replicate these findings. Moreover, serious methodological inadequacies inherent in

the susceptibility-scale paradigm increase measurement error and make meaningful interpretation of the findings difficult.

This thesis includes three interrelated experiments aimed at assessing the effects of hypnotic amnesia on seriation and subjective organization using appropriate methodological procedures. Three variables that differentiate the word-list and susceptibility-scale paradigms were varied across studies. These included stimulus material (test suggestions/words), number of stimulus presentations (single/multiple), and learning set (incidental/intentional). All three experiments failed to find any effect of partial amnesia on seriation or subjective organization. In Experiment 1 hypnotic subjects were tested on 12 test suggestions under incidental or intentional learning conditions. Following an initial recall trial they were administered an amnesia suggestion and challenged to recall once again. The suggestion was then cancelled, and subjects were given a final recall trial. During the suggestion period, both amnesic and nonamnesic subjects showed decreases in seriation from baseline levels. When the suggestion was cancelled, seriation remained at the level shown during the suggestion. In short, decreased seriation (i.e., disorganization) was not specific to amnesia and did not reverse following cancellation of the amnesia suggestion. Experiment 2

replicated Experiment 1 using twelve unrelated words (half high and half low imagery) rather than test suggestions as the stimulus material. Decreased seriation that was unrelated to amnesia performance was again found during the suggestion and after cancelling it. Experiment 3 also employed unrelated words as stimuli, and subjects received either a single presentation of the words or learned them to a stringent criterion before the suggestion. All subjects had an intentional learning set. Once again, the results indicated decreased seriation that was unrelated to amnesia performance during the suggestion and after cancelling it. In all three experiments changes in subjective organization across recall trial pairs either failed to occur or were unrelated to amnesia performance.

Although unrelated to memory organization, amnesia was related to the serial position of stimulus items in Experiments 1 and 3. In both cases items presented in the middle of the list were more subject to amnesia than those at the beginning. The results were inconsistent with respect to the end positions. Moreover, in Experiment 1 test suggestion type was related to amnesia. Distinctive test items (cognitive suggestions) were less subject to amnesia than relatively nondistinct items (motor suggestions). In short, variables that enhanced the memorability of stimulus items (i.e., beginning serial positions, high distinctiveness) appeared to increase their resistance to amnesia.

In the context of previous work, our findings on amnesia and organization indicate the following: When categorized words are the stimulus material, decreases in clustering are amnesia-specific. For unrelated items, decreases in seriation and subjective organization are unrelated to amnesia. These differences may occur because seriation and subjective organization are less salient organizational strategies than clustering and, therefore, more subject to disruption by the numerous procedural variations involved in testing for amnesia, even when amnesia does not occur. Procedures for testing this hypothesis are discussed.

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Finally, I wish to dedicate this thesis to the memory of my mother to whom I owe the most.

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The Effect of Methodological Factors on Hypnotic Amnesia and Disorganization

Historically, loss of memory for the events occurring during hypnosis was considered a natural consequence of being hypnotized (Janet, 1925). More recently, however, investigators have recognized that such amnesia rarely occurs spontaneously and, when it does, may be attributed to implicit suggestion (Barber, 1962; Evans & Thorn, 1966; Hilgard, 1965, 1966; Hilgard & Cooper, 1965). Thus, attempts to study hypnotic amnesia have focussed on memory losses that are explicitly suggested.

Recent research on hypnotic amnesia has focussed on integrating this phenomenon within the framework provided by current theorizing on memory processes (Coe, Taul, Basden, & Basden, 1973; Evans & Kihlstrom, 1973; Pettinati, 1979; Spanos & Bodorik, 1977; Spanos & Radtke-Bodorik, 1980). One aspect of memory that has received considerable attention in relation to hypnotic amnesia is the organization of recall.

This research has been conducted largely within the context of two experimental paradigms, the susceptibility-scale paradigm and the word-list paradigm. These paradigms employ different stimuli as target material as well as different methodologies. Moreover, they have obtained quite different results. On the one hand, research conducted with the word-list paradigm has established a reliable disorganization effect associated with hypnotic amnesia. The recall of amnesic subjects is less organized

during an amnesia suggestion than before the suggestion or after its cancellation (Spanos & Bodorik, 1977; Spanos, Radtke-Bodorik, & Stam, 1980). Nonamnesic subjects do not show such disorganization (Spanos & Bodorik, 1977; Spanos, Radtke-Bodorik, & Stam, 1980). On the other hand, the results obtained with the susceptibility-scale paradigm have been equivocal. Some studies involving this paradigm (Evans & Kihlstrom, 1973; Kihlstrom & Evans, 1979) reported a relationship between hypnotic susceptibility and disorganization but others have failed to replicate this result (Radtke & Spanos, in press; St. Jean & Coe, Note 1). More troublesome, however, is the failure to clearly demonstrate a relationship between disorganization and amnesia with the susceptibility-scale paradigm. A number of methodological problems associated with this paradigm might be responsible for these difficulties. Alternatively, the disorganization effect might be dependent upon one of the methodological factors that differentiate the two experimental paradigms.

To date, however, there has been no research comparing these two paradigms or assessing factors that might account for the often discrepant results that have been obtained with them. Such work is clearly needed because the two paradigms have given rise to alternative theoretical conceptualizations concerning amnesia. Such research would facilitate a comparison of the two theoretical positions as well as clarify the parameters of hypnotic amnesia.

Following a comprehensive review of past research on hypnotic amnesia, including an in-depth discussion of the two paradigms, a series of three studies that aim to provide such clarification are presented. By manipulating the methodological factors that distinguish one paradigm from another, these studies were designed to determine the factors that account for the discrepant findings obtained from these paradigms.

Amnesia Defined

A typical amnesia suggestion specifies the critical events or information that are to be forgotten. Frequently, the suggestion indicates that the forgetting will take place posthypnotically, i.e., after the subject has been awakened from hypnosis. Alternatively, the forgetting may take place while the subject is still "hypnotized". The suggestion itself, however, is only one component of the amnesia testing situation. Following administration of the suggestion, subjects are usually challenged to try to recall the critical material. A third component involves cancelling the suggestion, i.e., subjects are administered a prearranged signal indicating that they can recall the critical material once again.

Reversibility, i.e., the ability to recall the critical material following the cancellation cue without relearning, is considered to be an essential characteristic of amnesia. While this factor has been ignored in the past, there is now

general agreement concerning the importance of reversibility as an indicator of amnesia (Cooper, 1979; Evans & Kihlstrom, 1973; Nace, Orne, & Hammer, 1974; Spanos & Bodorik, 1977). Lack of reversibility has been taken to mean that subjects may have permanently forgotten the critical material.

Subjects may show various degrees of amnesia. A few fail to recall any of the critical material following an amnesia suggestion (total amnesia), some recall all of the material (full recall), and some recall parts of the material (partial amnesia). Thus, for most investigators, amnesia is defined by lack of recall of some/all of the critical material during the suggestion and reversibility.

Experimental Paradigms

The two experimental paradigms primarily used to study recall amnesia are the susceptibility-scale and word-list paradigms.

The Susceptibility-Scale Paradigm

The susceptibility-scale paradigm involves the study of amnesia in the context of the amnesia suggestions included on standard hypnotic susceptibility scales, particularly the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A; Shor & Orne, 1962) and the three forms of the Stanford Hypnotic Susceptibility Scales (SHSS:A, SHSS:B, Weitzenhoffer & Hilgard, 1959; SHSS:C, Weitzenhoffer & Hilgard, 1962). On these tests, the posthypnotic amnesia suggestion is the final test suggestion. It informs

subjects that, when they awaken, they will have difficulty remembering the test suggestions they were administered during hypnosis. Following awakening, they are asked to report everything that they can remember. Finally, a signal to cancel the amnesia is presented, and they are asked to report any new items that they could not remember previously. Essentially, then, the to-be-remembered items are a series of events (i.e., test suggestions) which occurred once. This situation is akin to an incidental learning task because subjects are not aware that they will be required to recall the items until the amnesia suggestion is presented.

There are five major problems with the general way this paradigm has been used to study suggested amnesia. First, there is no method for assessing degree of original learning. This leads to difficulties in interpreting the results because subjects may differ on what they can remember even before the amnesia suggestion is presented. Second, the recall task is extremely ambiguous. It is not clear to the subjects what they are supposed to be recalling. Subjects are asked to recall "everything that happened" to them during the hypnotic experience. Nevertheless, on the HGSHS:A, the SHSS:A, and the SHSS:B only nine of the twelve test items are scored as critical items and on the SHSS:C eleven of the twelve items are so scored. Furthermore, on all four scales many events such as

the suggestions for relaxation and subjects' private experiences are not considered to be scorable items. Thus, subjects often recall things which did "happen," but which are not scored on the recall task. This supposition is supported by Evans, Kihlstrom, and Orne (1973), who found that on the HGSHS:A high susceptibles used proportionately more words to describe experiences not related to specific test suggestions than medium and low susceptibles. Third, on the HGSHS:A subjects are limited with respect to the time allowed for recall. Frequently, this is not sufficient and subjects must attenuate their recall before they are finished. Fourth, after the amnesia suggestion is cancelled subjects are not asked to recall everything they can remember. Instead, they are asked to recall only those items which they did not remember previously. Under these conditions it is impossible to ascertain the degree of random fluctuation in recall. The conditions for testing recall after the suggestion is cancelled ought to be identical to those present during the amnesia suggestion. Finally, the testing conditions for the HGSHS:A and the individually administered Stanford scales differ sufficiently to suggest caution in generalizing from one to the other without empirical evidence demonstrating their equivalence. It has not been demonstrated that the written reports of subjects tested on the HGSHS:A are equivalent to the oral reports of subjects tested on the Stanford scales.

Hence, features which appear to be characteristic of amnesia assessed with the HGSHS:A may not be characteristic of amnesia assessed with the Stanford scales.

The Word-List Paradigm

The word-list paradigm has allowed tighter experimental control of extraneous variables. When words are used as the critical items, the experimenter can specify what the critical items are and eliminate ambiguity. Furthermore, degree of original learning can be controlled or at least assessed by having subjects learn the items to a certain criterion. Thus far, this paradigm has been used only under intentional learning conditions.

Variables Influencing Performance on an Amnesia Task

Among the most important variables that influence suggested amnesia are susceptibility, the presence or absence of a hypnotic induction procedure, instructions to simulate hypnosis, and instructions aimed at influencing amount of amnesia.

Susceptibility

Susceptibility refers to the subject's degree of responsiveness to suggestions. Standardized susceptibility scales, which may be administered with or without a preceding hypnotic induction procedure, consist of a number of different suggestions of varying difficulty. A susceptibility score on these scales is the number of suggestions passed, i.e., the number associated with an

overt response in the desired direction. On most^{8.} susceptibility scales, the subject's overt response to each suggestion is scored by the experimenter-hypnotist (Barber, 1969; Weitzenhoffer & Hilgard, 1959, 1962). Nevertheless, standardized scales on which subjects score their own response to each suggestion are also available (Shor & Orne, 1962). These self-scored scales are convenient because they allow groups of subjects to be tested simultaneously by a single experimenter. The intercorrelations between individually-administered, experimenter-scored scales and subject-scored group scales are high enough to serve as a rough but valid index of susceptibility (Shor, Orne, & O'Connell, 1962).

Hypnotic susceptibility is a relatively stable characteristic (Hilgard, 1973). Test-retest correlations for the standardized scales most commonly used are around $r = .80$ (Hilgard, 1965, 1973). These scales exhibit substantial test-retest reliabilities even when subjects are retested after a lapse of ten years, i.e., $r = .60$ (Morgan, Johnson, & Hilgard, 1974).

The results of a number of studies indicate that high susceptibles recall less than low and medium susceptibles during an amnesia suggestion (Ashford & Hammer, 1978; Coe, Taul, Basden, & Basden, 1973; Hilgard & Cooper, 1965; Kihlstrom & Shor, 1978; Thorne & Hall, 1974). Two others obtained such results only under certain conditions. Barber

and Calverley (1966) found a relationship between recall and susceptibility when an authoritative suggestion was used but not following a permissively-worded suggestion, instructions to simulate, or no suggestion. Similarly, Thorne (1969) found that highs recalled less than mediums and lows under hypnotic but not waking conditions. No relationship has been found between amount of recall and susceptibility when no amnesia suggestion is presented and spontaneous amnesia is the object of study (Evans & Thorn, 1966; Hilgard & Cooper, 1965).

A few studies showed that susceptibility was also related to the amount of reversibility, the implication being that susceptibility is therefore related to amount of amnesia (Kihlstrom & Evans, 1976; Kihlstrom & Shor, 1978; Nace et al., 1974). Kihlstrom and Evans (1976) matched high and low susceptibles on the number of items recalled during an amnesia suggestion. After the suggestion was cancelled, high susceptibles recovered significantly more items than low susceptibles. The failure of the low susceptibles to recover items after the suggestion was cancelled indicated that their recall decrement during the suggestion was due to factors other than amnesia. This suggests that recall deficits shown by high and low susceptibles during an amnesia suggestion are a function of different variables. On the other hand, this difference between highs and lows may simply be due to the methodological problems associated

with the susceptibility-scale paradigm. When the to-be-forgotten material is a list of words which has been learned to a criterion of two successive correct recall trials, virtually every subject, regardless of susceptibility, recovers all of the items after the suggestion is cancelled (Spanos & Bodorik, 1977).

When high and low susceptibles were compared on recall during a hypnotic amnesia suggestion and after its cancellation, highs had a relatively greater recall decrement during the suggestion than lows (Williamsen, Johnson, & Eriksen, 1965). However, these groups did not differ in amount recalled after cancellation of the suggestion. Finally, when amnesia is indexed by the difference between recall during the suggestion and after cancellation, susceptibility is related to amnesia, at least in hypnotic subjects (Spanos & Bodorik, 1977; Spanos, Radtke-Bodorik, & Shabinsky, 1980; Spanos, Radtke-Bodorik, & Stam, 1980).

Presence versus Absence of a Hypnotic Induction Procedure

Until relatively recently, many investigators assumed that administration of a hypnotic induction procedure greatly facilitated response to suggestion (Sarbin, 1962). In the last two decades, however, it has become increasingly clear that a hypnotic induction procedure is neither necessary, nor particularly helpful, in eliciting high levels of response to most suggestions. This generalization

is based on an extensive series of studies (reviewed by Barber, 1969; Diamond, 1974) indicating that nonhypnotic subjects administered short instructions aimed at enhancing their motivation and expectations of success (task-motivation instructions) show levels of response to suggestion equivalent to those of hypnotic subjects.

The data concerning suggested amnesia are not wholly consistent with this generalization. Although early research found that hypnotic and task-motivated subjects responded to amnesia suggestions in the same way (Barber & Calverley, 1966; Norris, 1973; Spanos & Ham, 1973; Thorne & Hall, 1974), several recent studies have found that hypnotic subjects showed more amnesia than task-motivated subjects (Radtke-Bodorik, Planas, & Spanos, 1980; Radtke-Bodorik, Spanos, & Haddad, 1979; Spanos & Bodorik, 1977; Spanos, Radtke-Bodorik, & Shabinsky, 1980; Spanos, Radtke-Bodorik, & Stam, 1980, Experiment 1; Spanos, Spillane, & McPeake, 1976; Spanos, Stam, D'Eon, Pawlak, & Radtke-Bodorik, 1980).

Several studies have attempted to delineate variables that account for the facilitative effects of hypnotic procedures on amnesia performance. Spanos, Radtke-Bodorik, and Stam (1980, Experiment 2) gave all subjects 10-minute preliminary instructions. For half of the subjects, these instructions consisted of suggestions for relaxation and for the other half suggestions for alertness and vigilance. Within the relaxation and alertness-enhancing treatments,

the instructions were defined as hypnotic for half the subjects and as nonhypnotic for the other half. The four treatment conditions did not differ on amount of amnesia. Thus past findings of greater amnesia in hypnotic than in task-motivated subjects cannot be attributed to defining the situation as hypnosis or to the relaxation component of standard hypnotic induction procedures.

Other research suggests that subjects' interpretations of the ambiguous amnesia testing situation at least partly account for the differences between hypnotic and task-motivated subjects. Spanos, Stam et al. (1980) pointed out that one ambiguous aspect of the amnesia testing situation is the challenge to "try to remember" which is presented before the cancellation signal. Subjects may interpret the challenge as a serious request to try to recall (active recall interpretation) or as a request for passive recall, i.e., to recall whatever comes to mind without actively attending to the task of recalling. Spanos, Stam et al. (1980) hypothesized that a hypnotic induction procedure predisposes subjects to interpret the remember challenge in terms of passive recall, whereas task-motivation instructions predispose them to interpret it in terms of active recall. By providing hypnotic and task-motivated subjects with either passive or active recall interpretations, they produced the following effects: (a) Passive recall instructions enhanced the amount of amnesia

for task-motivated subjects but had no effect on hypnotic subjects. This was consistent with their formulation because hypnotic subjects were assumed to adopt a passive recall set even without preliminary instructions. (b) Active recall instructions decreased the amount of amnesia for hypnotic subjects but did not affect task-motivated subjects. Again, this confirms their hypothesis; task-motivated subjects were expected to adopt an active recall interpretation in the absence of preliminary instructions.

In short, enhancement of amnesia following a hypnotic induction procedure as compared to a task-motivation condition seems to be related to differences in subjects' interpretations of the amnesia testing situation.

Instructions to Simulate Hypnosis

The use of subjects' verbal reports or overt responses to suggestion as valid indices of subjective experiences is problematic for hypnosis research (Coe, Note 2, Shor, 1972). In most hypnosis experiments, the overt response called for by the suggestions is both obvious and easy to perform. For instance, a subject asked to forget the number '4' can easily fake this suggestion without experiencing the slightest loss of memory. He need only refrain from verbalizing '4' when asked to count aloud.

Although no theorists have explicitly adopted a faking position, methodologies have been developed to differentiate

faked behaviour from behaviour that accurately reflects changes in the subjects' experiences (Orne, 1959, 1969, 1971). The most commonly employed of these methodologies is called the simulator-control design (Orne, 1959). When using it, subjects in one group, the simulators, are instructed to fake hypnosis to the best of their ability. These subjects are instructed to perform all of the tasks presented to them as if they were excellent hypnotic subjects. They are further cautioned to not allow themselves to experience any of the subjective effects called for by the suggestions. Simulating subjects are typically compared to hypnotic subjects who are administered the same suggestions but who are not asked to fake. When simulating and hypnotic subjects respond to suggestions in the same manner, no conclusions can be drawn concerning the variables affecting the performance of the hypnotic subjects (Orne, 1971). When simulating and hypnotic subjects perform differently, however, it suggests that the behaviour of the hypnotic subjects cannot be explained solely in terms of deliberate and sustained faking.

Some of the theoretical interpretations imposed on the results of simulation studies remain rather controversial (Orne, 1959; Spanos & Barber, 1973; Spanos & Chaves, 1970; Sheehan, 1971). Nevertheless, with respect to amnesia the empirical findings obtained with this design have been straightforward. Both Williamsen et al. (1965) and Barber

and Calverley (1966) found that low and high susceptible simulators tended to overplay the role of the amnesic subject. They all showed total nonrecall and low degrees of recognition of the critical material. On the other hand, nonsimulating hypnotic and nonhypnotic subjects frequently showed partial rather than total amnesia and relatively high degrees of recognition for the critical material.

Bowers (1966) also found that high susceptible hypnotic and simulating subjects responded differently to a posthypnotic amnesia suggestion. On the postexperimental inquiry, before the amnesia suggestion was cancelled, subjects were led to believe that the experiment was over. All simulators verbalized the critical material, whereas more than half of the hypnotic subjects did not. None of the simulators reported that they actually forgot any of the critical material during the experiment. In short, the results of simulation experiments indicate that "real" hypnotic subjects are not simply faking when they respond to amnesia suggestions.

Instructions Aimed at Influencing Amount of Amnesia

Kihlstrom, Evans, Orne, and Orne (1980) administered a modified version of the HGSHS:A to a large number of subjects. An additional recall test was interpolated between the usual recall test during the amnesia suggestion and that which followed the cancellation of the suggestion. Thus, subjects had their recall tested twice during the

suggestion and once again after the suggestion was cancelled. (The recall test after cancellation was modified so that subjects were asked to recall everything that they could remember.) One of the following four conditions preceded the second recall test: (a) a retest condition; subjects were given no additional instructions, (b) a cued condition; subjects were instructed to recall the remembered items in chronological order, (c) a challenge condition; subjects were encouraged to exert more effort in recall, and (d) an honesty condition; subjects were asked not to voluntarily withhold any items that they actually remembered.

All groups showed a significant and equal improvement in recall on Test 2. Nevertheless, all groups also showed a significant recall gain after the suggestion was lifted. These results are problematic for a number of reasons. First, they may simply indicate that subjects remember more if given more recall trials in the absence of further presentation trials. Research on memory suggests that this is a reasonable explanation (Thompson, Wenger, & Bartling, 1978). In fact, the initial recall deficits on the recall trial following the amnesia suggestion may be unrelated to amnesia and reflect instead a "normal" memory impairment. This hypothesis is impossible to evaluate, of course, because memory for the suggestions was not tested prior to the amnesia suggestion. A second difficulty lies with the

interpretation of these data provided by Kihlstrom et al. (1980). They argued that motivation and expectation are not important in producing amnesia because none of the experimental groups differed from the retest group. Furthermore, amnesia was only partly breached. Essentially, then, they have accepted the null hypothesis. Nonetheless, they provide no evidence that their experimental manipulations in fact were successful in motivating subjects or changing their expectations. Alternatively, administration of a retest alone may have influenced subjects' expectations, and therefore the retest condition may not have functioned as a true control group. At best these data suggest that amnesia can be partially reduced by introducing another recall trial during the amnesia suggestion period.

Howard and Coe (1980) attempted to vary the degree to which contextual manipulations placed demands on subjects to breach. Subjects were administered the HGSHS:A, and then rated their amnesia as voluntary or involuntary. In a second session, the SHSS:C was administered only to high susceptibles. This time subjects were randomly assigned to one of three conditions. Before being tested for amnesia, subjects in the polygraph group were hooked up to a "lie detector," those in the honesty condition were read instructions for honesty, and those in the relaxation condition were allowed to rest for the amount of time

required to administer instructions to the other two conditions. Three recall tests were administered, one immediately following treatment instructions, the second following a prompt to "...think carefully, perhaps you can remember more," and the third following cancellation of the suggestion.

Subjects in the polygraph and honesty conditions recalled more (i.e., showed less amnesia) on the first recall test than subjects in the relaxation condition, but the two treatment conditions did not differ from one another. No group differences were obtained on the second and third recall trials. These results indicate that Howard and Coe's manipulations successfully reduced amnesia compared to a no treatment control group.

An important difference between this experiment and that of Kihlstrom et al. (1980) is that the breaching instructions were administered before the initial test of amnesia. Kihlstrom et al. (1980), on the other hand, administered breaching instructions after the initial amnesia test but before cancellation of the suggestion. Once subjects have shown some level of amnesia they may be less willing to respond to experimental demands suggesting that their forgetting is not real than if they have not yet committed themselves to any level of amnesia. Moreover, once amnesia has been tested subjects may be less likely to interpret breaching instructions as requests to breach.

Instead, they may be viewed as a test of subject's ability to withstand external influence.

In fact, Howard and Coe (1980) also found that on the first recall trial subjects who rated their amnesia on the HGSHS:A as voluntary recalled more than subjects who rated their amnesia as involuntary. Thus, breaching occurred to a greater extent for one subset of subjects than for another. Similar findings were reported by Schuyler and Coe (in press). Following an amnesia suggestion, subjects were tested for recall, administered a "lie detection" manipulation, and tested for recall once again. Voluntary forgetters breached; involuntary forgetters did not breach. One possible explanation for these findings is that subjects who perceived their amnesia to be involuntary were more convinced of its reality and hence less vulnerable to external influence than subjects who perceived their amnesia to be voluntary, e.g., due to self-distraction or some other willfully employed cognitive strategy.

Radtke-Bodorik et al. (1979) varied the recall conditions in an amnesia experiment involving the word-list paradigm. Half the subjects recalled orally as in previous word-list studies and half wrote their recall. It was hypothesized that visual access to recalled words would break down amnesia by providing subjects with retrieval cues. Contrary to expectation, subjects in the spoken and written recall conditions did not differ on amnesia or

disorganization. Availability of such cues, however, did not necessarily lead subjects to use them. Thus, the manipulation may have been unsuccessful.

More recently, Spanos, Stam et al. (1980) showed that amnesia could be enhanced or decreased by manipulating subjects' interpretations of the amnesia testing situation. They also used the word-list paradigm. Amnesia was enhanced by instructions that lead subjects to actively attend away from the critical material during the amnesia suggestion and to recall passively (i.e., not to focus on the act of recalling but to recall anything that happened to spontaneously come to mind). On the other hand, amnesia was decreased by instructions to actively recall, i.e., to focus on the task of recalling the items during the amnesia testing period. Moreover, hypnotic susceptibility was an important factor. High susceptibles who were administered instructions asking them to focus on the recall task following the challenge did not follow instructions. Instead, they continued to attend away from the target material and freely admitted to their inattention during the postexperimental inquiry. High susceptibles are strongly invested in performing the role of the good hypnotic subject (Dolby & Sheehan, 1977; Sarbin & Coe, 1972). In the amnesia testing situation, the role of the good hypnotic subject is clear; to forget until the cancellation signal. Thus, any preliminary instructions which contradict these role

expectations will tend to be ignored or reinterpreted by the subject who is motivated to be a good hypnotic subject.

The implications of these results are straightforward and pertain specifically to the theoretical positions to be discussed shortly. Amnesia does not appear to be something which happens to subjects and which is beyond their control. Rather, subjects actively participate in responding to the suggestion by attending away from the target material. Thus, it is not surprising that any experimental manipulation that serves to draw subjects' attention back to the recall task and the target material will result in increased recall. Alternatively, instructions that lead subjects to attend away will decrease recall.

Summary

In summary, the following conclusions may be drawn from the evidence examined thusfar: (a) High susceptible subjects are more likely to show amnesia than low susceptible subjects. (b) The administration of a hypnotic induction procedure is not necessary for the occurrence of amnesia, but such a procedure may facilitate amnesia to a greater extent than do task-motivation instructions. Such facilitation can probably be attributed to subjects' interpretations of the amnesia testing situation. (c) Simulators differ from "real" amnesics in their tendency to overplay the role of the amnesic subject. (d) Instructions aimed at breaking down amnesia have been successful to the

extent that they have served to draw subjects' attention back to the recall task. In a similar fashion, instructions that led subjects to attend away from the recall task enhanced amnesia.

Disorganized Recall

The research on disorganized recall and hypnotic amnesia will now be summarized. Work done under the two experimental paradigms will be presented separately.

Susceptibility-Scale Paradigm

Disorganized recall was first studied in the context of the susceptibility-scale paradigm when Evans and Kihlstrom (1973) hypothesized that suggested amnesia involves a temporary breakdown of the temporal sequence of recall (i.e., seriation). Following administration of the HGSHS:A, the SHSS:B, and the SHSS:C, they compared the order of recall of the test items during the amnesia suggestion (output order) with the order in which the test items occurred on the susceptibility scale (input order). Their analysis included only those subjects who recalled at least three items during the amnesia suggestion (partial amnesics). Temporal organization was assessed by calculating a Spearman rank-order correlation coefficient (rho score) between the order of item administration and the order of item recall for each subject. Low susceptibles recalled the items in temporal sequence, whereas high susceptibles recalled them in a relatively nonsequential

fashion. Furthermore, the first item recalled by the low susceptibles tended to be the first test item administered on the susceptibility scale. This was not true for high susceptibles. Subjective organization was also assessed by pooling the data for high and low susceptibles, respectively, and employing a modification of Tulving's (1962) SO measure. These data suggested that, as a group, high susceptibles recalled in a less consistent, more idiosyncratic manner than low susceptibles, although it was impossible to determine whether this difference was statistically significant. Evans and Kihlstrom (1973) explained their findings in terms of a disruption in the "normal" retrieval process. They argued that cues such as temporal sequence are used less effectively during suggested amnesia than in "normal waking" memory.

Despite their interesting findings, this study had a number of shortcomings in addition to the standard problems associated with the susceptibility-scale paradigm. First, degree of amnesia is related to susceptibility (Coe et al., 1973; Kihlstrom, 1980; Nace et al., 1974; Spanos & Bodorik, 1977; Williamsen et al., 1965) and Evans and Kihlstrom (1973) demonstrated a relationship between disorganization and susceptibility. Nevertheless, it does not necessarily follow from their data that amnesia, defined in terms of reversibility, is related to disorganization. At best amnesia is moderately correlated with susceptibility and

hence high susceptibility cannot be equated with amnesia. Evans and Kihlstrom could not compare amnesics and nonamnesics on organization, because they could not assess reversibility with the unmodified versions of the susceptibility scales used in their study. A second shortcoming of their study pertains to the reversibility of the disorganization. Evans and Kihlstrom (1973) did not demonstrate that high susceptibles produced ordered recall after the suggestion was cancelled or that they would temporally order their recall if asked to recall in the absence of any amnesia suggestion. Third, their analysis focussed on differences between high and low susceptibles and virtually ignored those subjects scoring in the medium range of susceptibility. Adequate justification for omitting these data was not given. Finally, their rho data contains an artifact which may or may not account for the disorganization effect. At lower levels of recall, rho may take on a smaller number of possible values than at higher levels of recall. As a consequence, small transpositions in ordering result in smaller rho values at lower levels of recall than at higher recall levels. Because in general high susceptibles recall fewer items than low susceptibles, it is possible that the low rho scores of high susceptibles are due to their lower recall levels per se and do not reflect any actual disorganization. Furthermore, some of Evans and Kihlstrom's analyses involved classifying subjects

as showing ordered versus random recall. This classification was made on the basis of whether the rho scores achieved statistical significance. At lower levels of recall, rho must approach unity to be statistically significant. Hence, this type of analysis is clearly biased toward showing a disorganization effect (nonsignificant rho's) for subjects who show low levels of recall (i.e., amnesia).

The results reported by Evans and Kihlstrom (1973) have been replicated several times in their own laboratory (Kihlstrom & Evans, 1979). Nevertheless, two groups of independent investigators failed to obtain a disorganization effect for high susceptibles (Radtke & Spanos, in press; St. Jean & Coe, Note 1).

Amnesia and disorganization. Further research has been aimed at dealing with some of the critical issues discussed above. In an attempt to demonstrate a direct relationship between amnesia and disorganization Kihlstrom and Evans (1979) divided subjects into those who showed reversibility and those who did not. Reversibility was defined as recalling two items on the recall test after the amnesia suggestion was cancelled that were not recalled during the amnesia suggestion. On the SHSS:C, subjects who met this reversibility criterion had significantly lower rho scores (and, hence, were more disorganized) than subjects who did not meet the criterion (one-tailed t-test). On the HGSHS:A,

there was only a trend in this direction providing equivocal support for their hypothesis (one-tailed t-test). On both the HGSHS:A and the SHSS:C, subjects with disorganized recall scored higher on hypnotic susceptibility, showed more amnesia (i.e., recalled fewer items during the amnesia suggestion), and more reversibility (i.e., recalled more items after the suggestion was cancelled) than subjects with organized recall (one-tailed t-tests). Furthermore, subjects proved to be relatively consistent in their performance on the two amnesia suggestions. When tested on the SHSS:C, subjects with disorganized recall on the HGSHS:A scored high on hypnotic susceptibility and showed more amnesia than subjects with organized recall on the HGSHS:A. High susceptibles with disorganized recall on the HGSHS:A were more likely to show disorganized recall than either total amnesia or organized recall on the SHSS:C. High susceptibles with organized recall on the HGSHS:A, however, were equally likely to show total amnesia, disorganized recall, or organized recall on the SHSS:C. These results suggest that disorganized recall is related to both susceptibility and amnesia. Nevertheless, the general problems associated with studying amnesia via the susceptibility-scale paradigm preclude any firm conclusions. Moreover, Radtke and Spanos (in press) failed to replicate these findings.

Artifact in the rho measure. To assess the importance of artifact in the rho data Kihlstrom and Evans (1979) compared the rho scores of high and low susceptibles who had the same level of recall. Low susceptibles had higher rho scores than high susceptibles at most recall levels (one-tailed tests), indicating that the recall of low susceptibles reflected more temporal organization than the recall of high susceptibles. While these data suggest that the disorganization effect is not merely an artifact, they do not alter the fact that the rho data are noisy. More problematic, however, for any set of rho data, it is impossible to distinguish between artifact and disorganization. This clearly limits the precision with which the phenomenon may be studied.

Reversibility of disorganization. Kihlstrom and Evans (1979) report two experiments pertaining to the reversibility of disorganization after cancellation of the amnesia suggestion. This required a modification of the standard susceptibility-scale paradigm. They administered the HGSHS:A and asked subjects to recall everything they could remember after the suggestion was cancelled rather than to recall only items additional to those recalled during the suggestion. Taken together, their results indicated that high susceptible total amnesics (i.e., recalled three or fewer items during amnesia) attained a relatively high degree of temporal organization after

cancellation. (They do not report means, however.) High susceptible partial amnesics, on the other hand, did not increase the organization of their recall after cancellation unless specifically instructed to recall the items in the order of administration. Moreover, the organization of low susceptibles' recall decreased after cancellation when they were not instructed to temporally order their recall. Clearly, these results fail to demonstrate reversibility of disorganization.

Instructions to organize during amnesia. Kihlstrom and Evans (1979) were also interested in the effect of administering instructions to organize recall during the amnesia suggestion (as opposed to after its cancellation) on subjects' tendencies to organize. Using a modification of the HGSHS:A, subjects were administered two recall tests during the amnesia suggestion. The first test followed the usual instructions for recall. Prior to the second test, however, subjects were either asked to simply recall again or were asked to recall the items in their order of occurrence. They then compared the change in rho scores of high and low susceptibles in each condition. When instructed to order their recall, the rho scores of both high and low susceptibles increased significantly from the first to the second recall test. Nevertheless, high susceptibles' rho scores were significantly lower than low susceptibles' rho scores during both recall tests and in

both conditions. Despite the significant difference between high and low susceptibles, the rho scores of the high susceptibles were relatively high throughout and do not seem to reflect disorganization in any absolute sense. For example, the lowest mean reported which was for high susceptibles in the control condition for the first recall test is .62 and the mean rho score for high susceptibles in the experimental condition on the second recall test was .85. Given these data, it is not surprising that high susceptibles did not show a further significant increase in organization following cancellation of the suggestion.

Recognition amnesia and disorganization. One further criticism outlined by Coe (1978) focusses on the limitation of the disorganization effect to partial amnesics. Obviously, subjects must recall something during the amnesia suggestion in order for us to study the order of recall. As a result, the subjects who are most responsive to the amnesia suggestion, i.e., those who recall three or fewer items, are excluded from the analysis. Coe (1978) questioned the validity of an effect based on such a biased sample and the assumption that one can learn anything concerning total amnesics from the study of partial amnesics. In an attempt to assess the disorganization of total amnesics, St. Jean and Coe (Note 1) modified the susceptibility-scale paradigm. Following the recall test during the amnesia suggestion, they gave subjects a

recognition test and asked them to rank order any recognized items in the order in which they had been presented during the susceptibility test. Using Kihlstrom and Evans's (1976) reversibility criterion, they classified subjects as (a) total amnesics if they recalled three or fewer items during the amnesia suggestion and showed reversibility, (b) partial amnesics if they recalled four or more items during the suggestion and showed reversibility, or (c) nonamnesics if they recalled four or more items during the suggestion, but did not show reversibility. Total amnesics correctly ranked the first item less frequently than partial amnesics or nonamnesics. This is analogous to what is found for high susceptibles on a recall test. Similarly, on the SHSS:C the rank orderings of total amnesics were less accurate than those of partial amnesics. The difference between total amnesics and nonamnesics was only marginally significant, however. On the SHSS:B, there were no statistically significant differences. Thus, at best these data provide weak support for Evans and Kihlstrom's (1973) disrupted retrieval hypothesis.

Challenges to the relationship between hypnotic amnesia and disorganization. The results of two recent experiments lead to questions concerning the relationship between hypnotic amnesia and disorganized recall. Wagstaff (1977) asked pairs of subjects to close their eyes and "act out" eleven suggestions taken from the SHSS:C. He then

instructed one member of the pair to pretend that he or she could remember only three of the suggestions. Both subjects wrote a description of what had happened since they were told to close their eyes. Finally, the other member of the pair received the instructions to pretend to remember only three things and wrote them down. Thus, one member of each pair, the pretend initially member, recalled only once, but the other member recalled twice; first, with no limit on the number of items to be recalled and then pretending to remember only three items. On the first recall test subjects who were not asked to pretend initially tended to recall first the item which was administered first, whereas subjects asked to pretend did not. Furthermore, pretend subjects did not recall their three items in the order of administration, whereas subjects who were not pretending ordered the first three items recalled according to temporal order. When finally asked to pretend, this latter group no longer showed a tendency to recall first the first item presented, nor did they organize the three items recalled according to their presentation order. These results led Wagstaff to suggest that disorganized recall is a function of voluntary attenuation of recall. When subjects were asked to repeat only three items, they did not order them temporally even if they had just finished recalling everything they could remember in an organized fashion.

Methodological problems preclude such a straightforward conclusion, however. First, there is no evidence that subjects in the pretend group would have organized their recall if given an opportunity to recall everything they could remember. Second, the effect of administering different instructions to subjects tested simultaneously is indeterminate. Third, although some investigators, e.g., Coe (1978), would argue that disorganization should be evident for subjects who recall three or fewer items, Evans and Kihlstrom's (1973) disorganization effect was found for subjects who recalled more than three items. Would Wagstaff (1977) have obtained the same results if the pretend subjects were asked to remember more?

Schwartz (1978) administered a modification of the SHSS:C to two groups. One group, consisting entirely of high susceptible subjects (above 7 on the SHSS:C), was administered a hypnotic induction procedure involving target fixation prior to the test suggestions. The other group consisted of subjects who were unselected for susceptibility. These unselected subjects were not administered a hypnotic induction procedure. Before administration of the amnesia suggestion, all subjects were asked to recall what had happened since they looked at the target. The nonhypnotic subjects' recall was characterized by temporal organization, while the recall of the hypnotic subjects was disorganized. The first item recalled by the

nonhypnotic subjects tended to be the first item administered and their rho scores were significantly higher than those of the hypnotic group. Thus, a lack of temporal organization was evident in the recall of high susceptible hypnotic subjects when no amnesia was present. Although Schwartz (1978) apparently tested subjects on the amnesia suggestion, he neither presented nor discussed these data.

In a follow-up study, high and low susceptibles were selected according to their performance on the HGSHS:A (Schwartz, Note 3). All subjects performed eleven unspecified "independent and noncontingent activities." One group of high susceptibles and all the low susceptibles then received a standard hypnotic induction procedure, while a second group of high susceptibles "were told to keep their wits about them and asked not to become entranced by the situation." This latter "reality test" group was informed that the treatment procedure was occurring instead of a hypnotic induction procedure. Finally, all subjects were asked to recall what they had done since sitting down in the laboratory chair. The results were consistent with those of Schwartz (1978); the rho scores of the high susceptible hypnosis group were significantly lower than those of the two nonhypnosis groups. These findings are problematic for Evans and Kihlstrom's claim that disorganization is a feature of amnesia. Schwartz's data suggest that disorganization may characterize the recall of high

susceptibles even when no amnesia suggestion is given. Nevertheless, Kihlstrom and Evans (1979) present their own data which contradicts that of Schwartz (1978, Note 3). When they omitted the amnesia suggestion and tested subjects for recall, high and low susceptible hypnotic subjects who recalled more than three items on the HGSHS:A did not differ on either number of items recalled or rho scores. The factors responsible for these conflicting results remain to be determined.

Conclusion. The data obtained on disorganization and hypnotic amnesia using the susceptibility-scale paradigm are simply not convincing. The methodological problems are numerous even when slight corrective modifications are introduced into the paradigm. Two failures to replicate the disorganization effect have been reported and Schwartz's data indicate that disorganization may be a characteristic of the recall of high susceptible hypnotic subjects in the absence of amnesia. Moreover, reversibility of the disorganization upon cancellation of the amnesia suggestion has yet to be demonstrated. Furthermore, the data analysis focusses on only a proportion of the sample. There has been no attempt to explain the data for total amnesics or medium susceptible subjects. In short, one cannot conclude on the basis of this research that suggested amnesia is associated with disorganization of recall.

Word-List Paradigm

The first attempt to study disorganized recall with the word-list paradigm did not yield significant results. Coe et al. (1973) examined organization of recall while simultaneously looking for retroactive inhibition during suggested amnesia. The words were instances of taxonomic categories and, hence, Coe et al. (1973) assessed clustering of recall. Subjects were classified as high, medium, or low susceptible on the basis of their HGSHS:A scores. At each susceptibility level, half of the subjects were administered an amnesia suggestion and half were not. The word lists consisted of 35 words with seven words in each of five different taxonomic categories. All subjects received three study-test trials on List 1 and were then administered the hypnotic induction procedure and first eleven suggestions of the SHSS:C. Next, they received three study-test trials on List 2. Subjects in the no amnesia condition were awakened, while those in the amnesia condition were administered the final (amnesia) suggestion and awakened. List 1 recall was tested first, followed by a recall test for List 2. For those subjects in the amnesia condition, the suggestion was cancelled and all subjects were asked to recall all of the words they remembered from both lists. During the amnesia suggestion, none of the groups differed significantly on degree of clustering.

In order to understand these negative results, it is important to note that Coe et al. compared the recall of subjects who had received an amnesia suggestion with that of subjects who had not. While the suggestion did reduce recall relative to the no suggestion condition, not every subject, even among the high susceptibles, would necessarily show amnesia. The results for nonamnesic subjects may have masked any effects associated solely with amnesia. Moreover, all comparisons were made between subjects. This may have been a relatively insensitive way to test the disorganization hypothesis, particularly if there were wide individual differences in clustering within both suggestion and no suggestion groups. To demonstrate disorganization it is important to show not only that amnesics organize less than nonamnesics, but also that during an amnesia suggestion amnesics disorganize relative to what they do before the suggestion and after cancelling it.

Spanos and Bodorik (1977) took these factors into account and obtained evidence for a relationship between suggested amnesia and disorganized recall. Their list was composed of nine words with three words in each of three different taxonomic categories. Subjects learned the list to a criterion of two successive correct trials in a free recall paradigm. This established learning at a high level and also allowed clustering to reach a stable level. Subjects were randomly assigned to two groups. One group

learned the list following a hypnotic induction procedure and the other following task-motivation instructions. Following list learning, all subjects received an amnesia suggestion, were tested for recall, heard the cancellation signal, and were again tested for recall. Hypnotic partial amnesics clustered less during the amnesia suggestion than before it or after it was cancelled. Only two task-motivated subjects showed partial amnesia and, therefore, the extent of their disorganization could not be assessed statistically. Full recallers (subjects who recalled as many items during the suggestion as after its cancellation) in both groups showed no change in clustering across recall trials.

A replication of this study tested subjects who scored six or above on the HGSHS:A (Spanos, Radtke-Bodorik, & Stam, 1980, Experiment 1). As a result of the subject selection procedures, more task-motivated subjects showed partial amnesia than in the original study. Analyses indicated that task-motivated partial amnesics showed the same degree of clustering breakdown during the amnesia suggestion as the hypnotic partial amnesics. Results for the full recallers were identical to those of the original study. Additional replications of the basic findings are found in Spanos, Radtke-Bodorik, and Stam (Experiments 2 and 3, 1980) and Radtke-Bodorik et al. (1979), who used a different word list. A reanalysis of data from three experiments revealed

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hypnotic high amnesics. Thus, it is impossible to determine whether treatment instructions or amount of amnesia were responsible for the disparate results. Furthermore, number of learning trials had no effect on clustering on any of the three recall trials. These findings demonstrate that the disorganization effect does not depend on list length or number of learning trials. It is a robust phenomenon, at least for hypnotic subjects.

Possible artifact in clustering measures. Changes in organization scores can occur artifactually from the application of certain clustering measures to recall protocols of different length. The predominant measure used by Spanos et al. was a Z-score measure (Frankel & Cole, 1971), which takes statistical reliability into account. The unfortunate property of this measure is that the maximum possible amount of clustering increases with the number of words recalled and, hence, two subjects who both organize their recall to the maximum degree, but who also recall a different number of words will receive different clustering scores. As a result, amnesic subjects may appear to disorganize during the suggestion because they recall fewer words.

This was shown not to be the case in a reanalysis of previous data (Spanos, Radtke-Bodorik, & Stam, 1980). To eliminate the artifact, each subject's recall protocols for the trials before the suggestion, during it, and after

cancelling it were equated for number of words, and clustering was measured on the equated protocols. For example, if a subject recalled five words during the amnesia suggestion, the clustering score for the recall trial before the suggestion was calculated on the first five words recalled before the suggestion. The same procedure was followed for the trial after the suggestion was cancelled. Again, partial amnesics showed a breakdown in organization, whereas full recallers did not. The procedure was repeated using the last n words recalled on the trials before the suggestion and after its cancellation. The same results were obtained emphasizing that the disorganization effect is not an artifact of variance in the number of words recalled across trials.

Clustering has also been assessed using two other measures. Spanos and Bodorik (1977) employed Bousfield and Bousfield's (1966) ratio of repetition, which was the same measure used by Coe et al. (1973), while three recent studies used Roenker, Thompson, and Brown's (1971) adjusted ratio of clustering (ARC) (Radtke-Bodorik et al., 1980; Spanos & D'Eon, 1980; Spanos, Stam et al., 1980). According to Murphy's (1979) results, both of these measures are less confounded with number of items recalled and number of categories than the Z-score measure. In each case, the disorganization effect was associated with partial amnesia. Furthermore, clustering scores assessed on equalized recall

protocols using the Z-score measure were highly correlated with clustering scores assessed on unmodified recall protocols with the ARC measure (Spanos & D'Eon, 1980; Spanos, Stam et al., 1980).

Faking and disorganization. Although shown to be reliable, it was also necessary to eliminate subject faking as a possible cause of disorganization. In past simulation studies, faking subjects invariably showed total amnesia (Barber & Calverley, 1966; Williamsen et al., 1965). Nevertheless, it might still be argued that some subjects fake amnesia only partially and that they disorganize because they believe that is what a hypnotic subject would do. Alternatively, the disorganization effect might not be due to faking, but instead might result from the reduced recall of partial amnesics. Organization might be necessary to aid subjects in recalling all of the items. If they choose to recall only a few items during amnesia, they may have less need to organize the items.

The partial faking and reduced recall hypotheses were tested within a single experiment (Spanos, Radtke-Bodorik, & Stam, 1980, Experiment 3). High susceptible subjects were randomly assigned to one of three treatment conditions: (a) hypnotic, (b) simulation, or (c) reduced recall. Low susceptibles were assigned to simulation or reduced recall conditions. Orne's (1971) simulator-control paradigm was employed for the simulation treatment with one important

modification. Each simulator (high and low susceptibles) was yoked to one of the high susceptibles in the hypnotic condition who showed partial amnesia. Simulators were asked to fake amnesia by failing to recall during the amnesia suggestion the same number of words which their yoked partial amnesics had failed to recall. They then went through the same experimental procedures as the hypnotic group. Reduced recall subjects (high and low susceptibles) were yoked to the same partial amnesics. They were told that they would not be hypnotized and after learning the word list were simply asked to recall _ words. The blank was replaced by the number of words recalled during the suggestion by the partial amnesic to whom they were yoked. Only the hypnotic partial amnesics showed a significant breakdown in organization. The four control treatments responded like full recallers and showed no change in organization across the three recall trials despite the reduction in recall. Thus, the disorganization effect cannot be accounted for parsimoniously either in terms of subjects' faking or in terms of reduced recall.

Subjective disorganization. Thus far, in our treatment of the word-list paradigm we have considered the association between suggested amnesia and only one type of organization, organization according to taxonomic category. Another line of research has attempted to generalize the disorganization effect to situations involving lists of unrelated words

where subjects develop their own idiosyncratic patterns of organization during learning (i.e., subjective organization). An initial experiment obtained negative results (Spanos, Radtke-Bodorik, & Shabinsky, 1980). Hypnotic and task-motivated subjects learned a list of eight unrelated words prior to administration of an amnesia suggestion. During the amnesia suggestion, there was a decrease in subjective organization for all subjects. However, the disorganization effect was unrelated to amnesia, susceptibility level, or treatment condition. A major problem associated with this study was that subjects' subjective organization scores on the learning trials tended to be rather low, suggesting that they were not organizing to any substantial degree, even before the suggestion. The list consisted of only eight words which is close to the immediate memory span. Thus, subjects may not have needed to organize in order to learn the list.

second study was undertaken to determine whether the disorganization effect could be obtained in a situation where subjects' levels of subjective organization were high during learning (Spanos, Minarik, & Radtke, Note 4). Hypnotic subjects received nine study-test trials on a list of eighteen unrelated words before administration of the amnesia suggestion. As in the Radtke-Bodorik et al. (1980) study, subjects were divided into high and low amnesics. Low amnesics forgot one or two words; high amnesics forgot

more than two. Consistent with previous findings involving clustering, the high amnesics showed a breakdown in the organization of recall, whereas the low amnesics and full recallers did not. Further replications are necessary, however, before we can conclude confidently that lower levels of subjective organization are associated with suggested amnesia.

Conclusion. Research employing the word-list paradigm has firmly established disorganization of recall as a characteristic of suggested amnesia. Statistical artifacts and faking were ruled out as explanations for disorganization. What is needed, then, is a theoretical account of amnesia and disorganization.

Theories of Suggested Amnesia

The three major hypotheses advanced to explain suggested amnesia are the repression hypothesis, the functional ablation or dissociation hypothesis, and the inattention hypothesis.

Repression Hypothesis

According to the repression hypothesis, amnesic subjects are likely to selectively forget events associated with negative affect. The counter-notion to repression is the enhancement hypothesis which predicts that subjects administered an amnesia suggestion will selectively recall items associated with positive affect. Hence, both hypotheses make the same predictions with respect to

amnesia; only the explanation varies. It has generally been assumed that items on a standardized susceptibility scale that were passed are associated with positive affect and those that were failed are associated with negative affect. According to the repression hypothesis, then, subjects ought to selectively forget failed items, whereas according to the enhancement hypothesis subjects ought to selectively remember passed items. Two studies found that low susceptible subjects selectively recalled passed items (Hilgard & Hommel, 1961; O'Connell, 1966) and one failed to find support for any selective recall hypothesis (Coe, Baugher, Krimm, & Smith, 1976).

The measure of selective recall used in most studies (i.e., Selective Recall Index [SRI]) has an inherent bias (Pettinati & Evans, 1978). High and low susceptibles differ not only on the number of items recalled during an amnesia suggestion but also on the relative number of passed versus failed items. Thus, high susceptibles pass a large proportion of the suggestions but tend to recall few of them during amnesia whereas low susceptibles pass only a small proportion of the suggestions but tend to recall many of them. As a result, the measure used is biased in the direction of providing higher scores for low susceptibles than for high susceptibles.

Pettinati and Evans (1978) compared the SRI with a new unbiased measure, the Recall Comparability Index (RCI).

Using the SRI, they replicated the results of Hilgard and Hommel (1961) and O'Connell (1966). Nevertheless, the RCI indicated that both high and low susceptibles showed a preference for recalling passed items. In an extension of this work, Pettinati and Evans (Note 5, Note 6) classified high susceptible subjects as amnesic if they recalled at least two additional items after the suggestion was cancelled and as nonamnesic otherwise. High susceptible amnesics obtained smaller RCI scores than high susceptible nonamnesics. Nevertheless, the mean RCI score for amnesics was positive suggesting that they still favoured passed items in their recall. Medium and low susceptible amnesics and nonamnesics did not differ on their preference for recalling passed items. One further study employed a still more stringent criterion for classifying subjects as amnesic (Pettinati, Note 7). Subjects were so-classified if they recalled less than four items on two recall tests during amnesia and recalled two additional items after the suggestion was cancelled. Again, high susceptible amnesics obtained lower RCI scores than high susceptible nonamnesics. Under these conditions, however, the amnesics showed no preference in their recall.

These results suggest that success/failure of a suggestion may act as retrieval cues for recall. During amnesia, however, some high susceptibles may no longer use these cues. Hence, they recall relatively fewer items

associated with success. This explanation stands as an alternative to the repression hypothesis.

Clemes (1964) obtained data from a study involving word lists which he interpreted as support for the repression hypothesis. He assumed that reaction time to a stimulus word on a word association test was indicative of the emotional impact of the stimulus word. A reaction time greater than 1.5 standard deviations above the subject's mean for all of the words was considered to be indicative of repression. Subjects learned a list of words composed of long reaction time (critical) words and the same number of neutral words. Subjects who were administered a hypnotic induction procedure and a posthypnotic amnesia suggestion to forget half of the words forgot more critical than neutral words. This discrepancy disappeared after the suggestion was cancelled.⁶ Unfortunately, none of the properties of the critical words were examined. For example, the critical words may have been low meaningful words or words less frequently associated with the stimulus word. To assume repression of the critical words may not have been justified. A recent review of research on selective recall and repression in nonhypnotic contexts has concluded that there is no empirical support for the repression hypothesis and that other variables are responsible for any apparent selective forgetting (Holmes, 1974).

Moreover, a recent extension of Clemes's study failed to replicate his results (Stam, Radtke-Bodorik, & Spanos, 1980)., Nonetheless, although there was no evidence of selective recall for critical items, Stam et al. (1980) found that variables affecting the degree to which words were initially learned (e.g., imagery value, serial position) predicted their resistance to amnesia. Well-learned words were particularly resistant to amnesia.

In short, there is no evidence to support the hypothesis that repressive processes are responsible for hypnotic amnesia.

Functional Ablation/Dissociation Hypothesis

The functional ablation hypothesis suggests that the forgotten events no longer have any influence upon the individual's behaviour. These memories are nonfunctional until recovered when the suggestion is cancelled.

This hypothesis is actually a more specific case of the notion of dissociation. In its strongest form this hypothesis holds that behaviours and cognitions which occur following a hypnotic induction procedure are completely independent of, and functionally isolated from, those behaviours and cognitions which occur during a nonhypnotic or waking condition (Janet, 1925). The notion of functional ablation can be considered a state-dependent hypothesis. According to this hypothesis, amnesia occurs because subjects are in a different state from the one in which they

originally encountered the forgotten material (Crowder, 1976). Thus, because hypnosis and waking are different states, events which have occurred following a hypnotic induction procedure ought not to influence ongoing cognitive processes during a nonhypnotic condition.

The functional ablation notion has led to the investigation of amnesia via methodologies designed to determine whether the critical, amnesic material is still active in memory. Several different methodologies have been employed. One of these involves testing recognition for items not recalled following an amnesia suggestion. Using hypnotic subjects, Bitterman and Marcuse (1945) suggested amnesia for some words (critical words), but not others (control words). Subjects who failed to recognize any of the critical words showed differential respiratory and cardiovascular responses to critical words as compared to control words. In addition, several studies have found that hypnotic subjects who failed to recall items following an amnesia suggestion readily recovered at least some of these items on a recognition test (Barber & Calverley, 1966; Hilgard & Cooper, 1965; Kihlstrom & Shor, 1978, Experiment 2; Williamsen et al., 1965; St. Jean & Coe, Note 1). These data run counter to the functional ablation hypothesis. They indicate instead that hypnotic memories are available during a nonhypnotic condition.

A second indirect method has employed a retroactive inhibition paradigm in which subjects learn two successive lists of words or nonsense syllables. Retroactive inhibition refers to a decrement in memory for the first list (List 1) as a function of learning the second list (List 2) (Baddeley, 1976). In the context of hypnosis research, subjects first learn List 1 under nonhypnotic conditions. One group then learns List 2 following a hypnotic induction procedure, while another learns List 2 in a nonhypnotic condition. List 1 relearning then occurs under nonhypnotic conditions. According to dissociation theory, all memories for List 2 should be isolated from those for List 1. Therefore, the theory predicts no interference of List 1 recall by List 2 when List 2 is learned following a hypnotic induction procedure.

Research employing this paradigm has obtained somewhat inconsistent findings. Two early studies found a reduction in retroactive inhibition when List 2 was learned following a hypnotic induction procedure (Nagge, 1935; Takahashi, 1958). As Takahashi (1958) pointed out, however, retroactive inhibition was not eliminated, and therefore the dissociation between the two conditions could at best have been partial.

A number of other studies which employed the same paradigm but also included a posthypnotic amnesia suggestion for List 2 obtained negative results (Graham & Patton, 1968;

Mitchell, 1932; Stevenson, Stoyva, & Beach, 1962).. Retroactive inhibition did not decrease when List 2 was learned in the hypnotic condition. More recently, Coe et al. (1973) and Coe, Basden, Basden, and Graham (1976), working with a modification of this paradigm, supported the results of these latter three studies. Subjects who showed some degree of amnesia for List 2 did not differ from full recallers on retroactive inhibition effects.

A large number of other studies, employing various methodologies, have also explored the hypothesis that amnesic material is dissociated from ongoing cognitive activity. In general, these studies have supported the findings obtained with the recognition and retroactive inhibition paradigms. Amnesia does not appear to result in, or from dissociation (Banister & Zangwill, 1951; Goldstein & Sipprelle, 1970; Norris, 1973; Patten, 1930, 1932; Scott, 1930; Stern, Edmonston, & Ulett, 1963; Strickler, 1930; Williamsen et al., 1965).

Recently, Hilgard (1974) formulated a modification of dissociationism, which he labeled neo-dissociationism. According to this hypothesis, two thoughts may be dissociated, for example, one may be conscious and the other unconscious, but they may continue to interfere with one another. The data in support of this hypothesis come largely from research which required subjects to perform two tasks simultaneously, one consciously and the second

purportedly unconsciously. A posthypnotic amnesia suggestion, instructing subjects to be unaware that they were performing the second task, was the method used to produce unconscious task performance. When performed simultaneously, the two tasks resulted in poorer performance than when they were performed separately (Knox, Crutchfield, & Hilgard, 1975; Messerschmidt, 1927; Stevenson, 1976).

These studies also found differences between conscious and unconscious task performance. Task performance decreased when performance was purportedly unconscious. Two factors appeared to contribute to this decrement: performance of the task and the additional task of keeping performance out of awareness. Although these findings suggest that amnesia is an effortful process, that interferes with other ongoing cognitive activity, they provide no direct support for the neo-dissociation hypothesis.

According to the neo-dissociation hypothesis, subjects are not viewed as actively engaged in bringing about their own forgetting in order to comply with experimental contingencies. Instead, they are viewed as being passively acted upon by the suggestion which automatically causes forgetting. This hypothesis does not explain how amnesia is engendered by a verbal suggestion or how it so quickly disappears following the cancellation signal. To date, this theory has not been clearly developed, at least not with

respect to amnesia. The onus is on its proponents to demonstrate the utility of dissociation as an explanation for hypnotic amnesia, particularly since recent evidence highlights the amnesic subject as an active participant in task performance.

Inattention Hypothesis

A third position emphasizes the influence of the social context and cognitive factors on subjects' responses to an amnesia suggestion (Coe, 1978; Spanos & Radtke-Bodorik, 1980; Spanos, Radtke-Bodorik, & Stam, 1980; Spanos, Stam et al., 1980; St. Jean & Coe, Note 1). Specifically, these investigators have developed a theoretical explanation based on inattention to account for suggested amnesia and disorganization. They argued that amnesia and disorganization occur to the extent that subjects attend to activities other than the recall of the target material (i.e., disattend to the recall task). When subjects disattend to the task of recalling the critical words, they alter their cognitive environment. In so doing, they no longer attend to the retrieval cues that were present during encoding. In the absence of these retrieval cues at recall time, retrieval will be less efficient. Hence, amnesia will occur. Furthermore, assuming that retrieval cues serve as a basis for the organization of recall their absence may also result in a decrease in organization. The body of data collected to date can be conceptualized within this framework.

For example, task-motivation instructions are less successful at inducing amnesia and disorganization than hypnotic instructions because they fail to provide an alternative focus for subjects' attention. The relaxation suggestions which accompany most standard hypnotic induction procedures repeatedly instruct subjects to focus on bodily sensations. By enhancing the regnancy of bodily sensations, these instructions set or cue subjects to attend to these sensations instead of to the critical material and recall task during the suggestion period. When alertness-enhancing instructions which also focus on bodily sensations replace the relaxation instructions or when nonhypnotic procedures also provide an alternative attentional focus, no differences in amnesia or disorganization occur (Spanos, Radtke-Bodorik, & Stam, 1980).

This explanation also provides a means to account for why hypnotic amnesics are more likely to describe their forgetting as involuntary (i.e., "effortless forgetting") than task-motivated amnesics. According to the inattention hypothesis, effortless forgetters attend away from the recall task but fail to define their inattention as self-generated distraction. Effortless forgetters may focus on sensations of relaxation but not define this as an attempt to avoid recalling the critical material. Consistent with this, Spanos and Bodorik (1977) found that effortless nonrecallers spontaneously reported sensations of

relaxation more frequently than effortful nonrecallers (i.e., those subjects who described their forgetting as voluntary). In addition to providing an alternative attentional focus, the wording of relaxation instructions associated with hypnotic induction procedures implies that relaxation is something happening to subjects rather than something they initiate. This cues subjects to define their experiences and behaviour as effortless, involuntary occurrences. Thus, the hypnotic context predisposes subjects to engage in inattention without defining it as distraction. Simulators were more likely to report effortless forgetting than partial amnesics (Spanos, Radtke-Bodorik, & Stam, 1980), suggesting that the demands for effortless forgetting in response to an amnesia suggestion are reasonably explicit. Task-motivated subjects, on the other hand, are encouraged to respond to the amnesia suggestion but are not provided with cues that redirect their attention or that define their responding as effortless. Under these circumstances, it would be difficult for these subjects to define inattention as anything but self-generated distraction.

Two recent experiments provide direct support for the inattention hypothesis. Spanos, Stam et al. (1980) conducted a series of studies in which they manipulated subjects' interpretations of the ambiguous aspects of the amnesia testing situation. They argued that the ambiguity

of the demands in this situation is responsible in part for the variability of responses to the amnesia suggestion. In other words, subjects show total amnesia, partial amnesia, or full recall depending on how they interpret the ambiguous demands. The two ambiguous aspects studied included subjects' interpretations of the amnesia suggestion and the challenge to try to remember. A typical amnesia suggestion is worded such that it conveys two contradictory messages. On the one hand, subjects are asked to forget or are told that they will not remember implying that active involvement of the subject is required. On the other hand, these suggestions imply that response to the suggestion will occur automatically. Depending on their interpretation of the suggestion, then, subjects may initially respond in one of two ways. They may attend away from the critical material or they may simply do nothing and wait for something to happen. These latter subjects are those who believe that their response to the suggestion will occur automatically. When the challenge to remember and recall is presented, subjects again have basically two choices. They may interpret the challenge as an instruction either to focus attention on the critical material and actively try to recall it or to maintain attention away from the critical material and passively recall whatever words spontaneously come to mind.

In their first experiment Spanos, Stam et al. (1980) provided subjects with varying interpretations of the remember challenge. All subjects were informed preexperimentally that they would learn a list of words and then be given an amnesia suggestion and challenge to remember. One group was informed that the remember challenge was a serious request to actively try their best to remember and recall the critical material. A second group was told that the challenge meant they were to recall whatever words came to mind but not to interfere with the forgetting process. Finally, a third group received no special instructions. Half of the subjects in each condition were randomly assigned to a hypnotic treatment and half to a task-motivation treatment. Active recall instructions virtually eliminated amnesia in both hypnotic and task-motivated groups. As predicted, passive recall instructions enhanced amnesia relative to no-instructions in the task-motivated groups, whereas no differences were found for the hypnotic groups. This is consistent with the hypothesis that under normal testing conditions (no preliminary instructions concerning interpretation of suggestions) task-motivated subjects are likely to interpret the challenge in terms of active recall, whereas hypnotic subjects adopt the passive recall interpretation.

The second experiment determined the efficacy of instructions to passively recall when challenged and to

respond to the suggestion by actively attending away from the critical material on amnesia in hypnotic and task-motivated subjects. Subjects administered dual instructions showed more amnesia than subjects receiving no special instructions.

The combined data for these experiments indicated that partial amnesics showed disorganization, whereas full recallers organized their recall. Thus, the contextual manipulations did not affect the relationship between amnesia and disorganization. To summarize, instructions to actively recall substantially reduced amount of amnesia whereas instructions to passively recall both alone and combined with instructions to disattend enhanced amount of amnesia. These results suggest that one strategy employed by amnesic subjects is to distract themselves from the recall task and only passively recall target items which happen to come to mind.

Spanos and D'Eon (1980) assessed the effects of a distraction task on amount of recall and organization of recall. Essentially, the distraction task provided an analogue for the events hypothesized to occur during amnesia according to the inattention hypothesis. High susceptible subjects were randomly assigned to two conditions, hypnosis plus amnesia or distraction. Low susceptibles were tested only in the distraction condition. The hypnosis condition was identical to the list learning-amnesia suggestion

paradigm employed in previous studies. Subjects in the distraction group learned the same list of words. Before list learning, however, they practiced counting backwards by three's from a 3-digit number. Recall of the words was oral, while the counting task was written. After subjects had learned the list to criterion, they were asked to perform the two tasks simultaneously but not to allow the recall task to interfere with the counting task. Hence, subjects were to maintain performance of the counting task at the same level as when it was practiced alone, while at the same time doing as well as they could on the recall task. In all three conditions some subjects showed partial recall and some showed full recall. The most important result revealed that partial recallers, regardless of condition, disorganized. When subjects attend to another task, they show partial recall and no longer organize their recall as they did when only recalling the words. Clearly, these data are consistent with an inattention hypothesis of suggested amnesia. They suggest that amnesia and disorganization may be due to inattention.

Moreover, the inattention hypothesis is consistent with the nonautomatic nature of organizational memory processes (Hasher & Zacks, 1979; Pellegrino & Battig, 1975; Pellegrino & Ingram, 1979). Attending away from the recall task implies that subjects are less likely to use previous strategies to aid retrieval. An organizational strategy can

be conceptualized as a means for solving a particular problem, i.e., how to learn a set of stimulus materials efficiently. When presented with an amnesia suggestion, subjects are faced with yet another problem-solving task, i.e., how to not retrieve a set of stimulus material. The situation is slightly more complex, however. There is a certain ambiguity present in the amnesia situation which is not present during learning. Subjects are told they will be unable to remember and then are challenged to try to remember. The way in which subjects resolve this ambiguity will determine how consistently they attend away and therefore the degree of output disorganization. Consistent attending away may be accompanied by some recall, but the particular words recalled will depend on factors such as salience rather than reflecting use of previous organizational strategies (Stam et al., 1980).

Thus, on this view amnesia involves the active participation of subjects in attending away from the recall task. This inattention strategy is likely to supplant any previous organizational strategy. Hence, disorganization results because what is recalled is determined by factors such as item salience, consistency of attending away, and so on. Further research concerning the characteristics of the items recalled during partial amnesia is necessary to confirm this hypothesis.

The Research Problem Defined

Two different paradigms, the susceptibility-scale and word-list paradigms, have been used to investigate the same general phenomenon with quite different results. Researchers employing the susceptibility-scale paradigm have been unable to demonstrate a reliable disorganization effect associated with hypnotic amnesia, while those using the word-list paradigm have consistently obtained this effect. These discrepant findings may have occurred because of one or more of the methodological differences between these paradigms.

To begin with the two paradigms have focussed on different types of recall organization. Clustering and subjective organization have been studied in the word-list paradigm, while seriation (i.e., the correspondence between input and output orders) has been studied with the susceptibility-scale paradigm. The disorganization effect may be restricted to certain types of organizational strategies. Alternatively, subjects' amnesia performance may be influenced by the adoption of an intentional as opposed to an incidental learning set. Under the susceptibility-scale paradigm learning is an incidental task. Subjects simply perform a variety of tasks without any expectation for later recall. Under the word-list paradigm, however, learning is intentional. Subjects are explicitly informed that they will have to recall the

material following each presentation. Thus, during presentation of the critical material subjects' cognitive sets differ under the two paradigms. This difference might affect the use of organizational strategies during original learning and during amnesia. Moreover, whereas the word lists are typically learned to a stringent criterion and hence are presented a number of times, the suggestions on the susceptibility scale are only presented once. Clearly, number of presentations might have an effect on subjects' tendencies to organize.

Aside from methodological differences between the paradigms, the susceptibility-scale paradigm contains a number of methodological inadequacies (detailed below) that may mask any real effects presented in the data. A series of three interrelated experiments were conducted in an attempt to clarify these issues.

EXPERIMENT 1

Major methodological criticisms of the susceptibility-scale paradigm include (a) ambiguity concerning what subjects are supposed to be recalling, (b) confounding item order and item content, (c) lack of a baseline measure of recall, (d) inadequate assessment of reversibility, and (e) use of the rho measure of organization which is confounded with the number of items recalled. Finally, although not necessarily a faulty procedure, in the susceptibility-scale paradigm recall is always tested as an incidental task. This experiment will involve modifications of the susceptibility-scale paradigm designed to take these six factors into account.

Subjects were randomly assigned to either an intentional or incidental recall condition. The incidental condition was similar to the conditions existing under the susceptibility-scale paradigm; subjects were not aware of the recall test until they had completed the test suggestions. In the intentional condition, subjects were informed, prior to administration of the test suggestions, that they would be asked to recall the suggestions at a later point in time. This was analogous to the testing conditions present under the word-list paradigm.

Following a standard hypnotic induction procedure, subjects were administered 12 test suggestions. These were defined clearly to subjects as test suggestions (i.e., as

distinct from the hypnotic induction procedure). Furthermore, the request for recall emphasized that subjects' recall should include only what they were asked to do and not how they responded, either overtly or subjectively. Each subject was administered the suggestions in a different random order and recall was tested on three trials: (a) before the amnesia suggestion, (b) following the amnesia suggestion, and (c) following cancellation of the amnesia suggestion. Seriation was assessed using both the rho score measure and the adjusted ratio of clustering (ARC; Roenker, Thompson, & Brown, 1971). ARC is not confounded with amount recalled (Murphy, 1979). Moreover, ARC can also be used to assess the similarity between output orders, i.e., subjective organization. Subjects may subjectively organize their recall across recall trials even if they do not show seriation. Thus, in addition to seriation we compared subjects' recall orders on the three recall trials.

Following the experimental session, subjects were tested for susceptibility on the Carleton University Responsiveness to Suggestion Scale (CURSS; Spanos, Stam, & Radtke, Note 8). Thus, in the experimental session all subjects were naive with respect to hypnotic procedures in general and hypnotic amnesia specifically. Relationships among susceptibility, responsiveness to the suggestions during the experimental session, and performance during the amnesia suggestion were assessed.

Method

Subjects

Subjects were 100 Carleton University undergraduate volunteers (52 females, 48 males; ages 17-47) recruited for an experiment involving responsiveness to hypnotic suggestions. They received course credit for their participation. None of the subjects had previously participated in an experiment involving hypnosis.

Materials

The twelve test suggestions are presented in Appendix A. The arm levitation, verbal inhibition, thirst hallucination, body immobility, and hand lock suggestions were taken from the Barber Suggestibility Scale (BSS; Barber, 1969); mosquito hallucination, moving hands apart, foot immobilization, and eye catalepsy were from the SHSS:B; and the visual hallucination, music hallucination, and arm rigidity were from the CURSS. A different random ordering of the suggestions was determined for each subject.

Procedure

Experimental session. Subjects were randomly assigned to a test suggestion order and to either an incidental or intentional recall condition. All subjects were administered a standard, 10 min hypnotic induction procedure taken from Spanos and Bodorik (1977). It included interrelated suggestions (a) designed to elicit cooperation

and maximize performance, (b) for relaxation, drowsiness, and sleep, and (c) of entering hypnosis (see Appendix B).

Subjects were then informed that they would be administered a number of test suggestions. Those in the intentional condition were also told that later on they would be asked to recall the suggestions (see Appendix B). The suggestions were administered and subjects' overt responses to each suggestion were scored by the experimenter in the manner prescribed by the authors of the scales from which they were taken.

Following the twelfth suggestion, all subjects were asked to open their eyes and write down as many of the test suggestions as they could remember (see Appendix C). They were given three minutes for recall. Next, a posthypnotic amnesia suggestion and waking instructions adapted from those used on the HGSHS:A and the Stanford scales were presented. Subjects were given another three minutes to recall the suggestions, the amnesia suggestion was cancelled, and subjects again had three minutes in which to recall the suggestions (see Appendix C).

Amnesia was defined in terms of reversibility. Amnesia scores were obtained by summing the number of items that were not recalled during the suggestion period but that had been recalled before the suggestion and after cancelling it. Standard scales of hypnotic susceptibility such as the HGSHS:A and the Stanford scales classify subjects as amnesic

if they recall three or fewer items during the suggestion. Moreover, organization scores cannot be obtained for subjects recalling as few as three items. In classifying subjects on amnesia we combined the criterion applied on the standard scales and the reversibility criterion outlined above. Subjects were classified as total amnesics if they recalled three or fewer items during the suggestion period and obtained an amnesia score greater than one. They were classified as partial amnesics if they recalled more than three items during the suggestion period and obtained an amnesia score greater than one. Three different measures of recall organization were used. Two seriation scores comparing input (i.e., presentation) and output (i.e., recall) orders were calculated, one with the ARC measure and one as a Spearman rank-order correlation coefficient (ρ). Subjective organization scores comparing subjects' output orders before the suggestion with those during and after cancelling it were also calculated using ARC. Recall organization scores could only be obtained for partial amnesics and nonamnesics. Total amnesics did not recall sufficient numbers of items.

Susceptibility testing. Subjects were administered a tape-recorded version of the CURSS in small groups of 5 to 10.

Each subject received two susceptibility scores: (a) the number of test suggestions passed during the

experimental session (maximum = 12) and (b) the number of test suggestions passed on the CURSS (maximum = 7). All analyses to follow that included susceptibility as a factor were conducted twice, once with subjects classified according to scores obtained in the experimental session and once with subjects classified according to CURSS scores. For susceptibility assessed during the experimental session, subjects scoring 0-4, 5-8, and 9-12 were classified as low, medium, and high susceptible, respectively. For susceptibility assessed on the CURSS, subjects scoring 0-1, 2-3, and 4-7 were classified as low, medium, and high susceptible, respectively. Although the two sets of scores were positively correlated ($r = .54$), it was necessary to determine whether they would interact differently with other factors.

Results

For all analyses to follow, $\alpha = .05$, unless otherwise stated.

Susceptibility

Scores for susceptibility assessed during the experimental session and on the CURSS were analyzed with separate 2x3 (Incidental/Intentional Condition x Total/Partial/No Amnesia) factorial analyses of variance (ANOVAs). The summary tables are presented in Table 1. The data indicate that subjects assigned to the incidental and intentional treatment conditions did not differ on

TABLE 1

Summary Tables for Susceptibility

Susceptibility Assessed During the Experimental Session

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.031	<1
Amnesia (B)	2	187.740	19.03*
A x B	2	2.347	<1
Within Cells	94	9.865	

Susceptibility Assessed on the CURSS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.583	<1
Amnesia (B)	2	21.212	6.44*
A x B	2	.257	<1
Within Cells	94	3.295	

*p<.01

susceptibility assessed either during the experimental session or in a later session on the CURSS.

The means for the Amnesia main effects were analyzed with a priori t-tests. When susceptibility was assessed during the experimental session, total amnesics ($\underline{M} = 9.40$, $\underline{sd} = 2.20$, $\underline{n} = 15$) scored significantly higher on susceptibility than either partial amnesics ($\underline{M} = 6.59$, $\underline{sd} = 3.26$, $\underline{n} = 39$), $\underline{t}(94) = 2.94$, or nonamnesics ($\underline{M} = 4.07$, $\underline{sd} = 3.21$, $\underline{n} = 46$), $\underline{t}(94) = 5.71$. Moreover, partial amnesics obtained significantly higher susceptibility scores than nonamnesics, $\underline{t}(94) = 3.69$.

When susceptibility was assessed on the CURSS, partial amnesics ($\underline{M} = 2.28$, $\underline{sd} = 1.91$, $\underline{n} = 39$), $\underline{t}(94) = 2.25$, and total amnesics ($\underline{M} = 3.20$, $\underline{sd} = 1.94$, $\underline{n} = 15$), $\underline{t}(94) = 3.35$, scored significantly higher than nonamnesics ($\underline{M} = 1.39$, $\underline{sd} = 1.64$, $\underline{n} = 46$). Total and partial amnesics did not differ significantly on CURSS susceptibility scores, $\underline{t}(94) = 1.67$, $\underline{p} = \underline{ns}$.

Amnesia

The effects of condition on amnesia scores were assessed with a one-way ANOVA. Subjects in the incidental ($\underline{M} = 2.30$, $\underline{sd} = 2.82$) and intentional conditions ($\underline{M} = 1.62$, $\underline{sd} = 2.36$) did not differ significantly on amount of amnesia, $\underline{F}(1,98) = 1.71$.

Table 2 shows the number of amnesic and nonamnesic subjects in each condition. A Chi-square test of

TABLE 2

Frequency of Amnesia by Experimental Condition

Amnesia	Incidental	Intentional
No	20	26
Partial	22	17
Total	8	7

association indicated no statistically significant relationship between Condition and Amnesia, $\chi^2(2) = 1.490$.

Recall

Effect of condition and amnesia. In order to determine whether conditions differed on original learning or postsuggestion recall, the number of items subjects recalled were analyzed by a 2x3x3 split-plot ANOVA with two between-subjects variables (Incidental/Intentional Condition x Total/Partial/No Amnesia) and one within-subjects variable (Recall Trial: Before/During/After the suggestion). The summary table is presented in Table 3. The main effects for Amnesia and Recall Trials as well as the Amnesia x Recall Trials interaction were statistically significant.

Scheffé post hoc multiple comparisons of the main effects indicated that (a) total amnesics ($M = 6.58$, $sd = 4.13$, $n = 45$) recalled significantly fewer items overall than either the partial amnesics ($M = 8.76$, $sd = 2.07$, $n = 117$) or the nonamnesics ($M = 9.67$, $sd = 1.56$, $n = 138$), (b) partial amnesics recalled significantly fewer items than nonamnesics, and (c) overall, amount of recall on the three recall trials differed significantly with subjects recalling the smallest number of items on the trial during the suggestion ($M = 7.36$, $sd = 3.28$, $n = 100$), the next largest number on the trial before the suggestion ($M = 9.12$, $sd = 1.59$, $n = 100$), and the most on the trial after the suggestion was cancelled ($M = 10.08$, $sd = 1.45$, $n = 100$).

TABLE 3

Summary Table for Condition x Amnesia x Recall Trial *

ANOVA on Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	6.018	1.20
Amnesia (B)	2	200.730	40.11*
A x B	2	.024	<1
Subjects Within Groups	94	5.005	
Recall Trials (C)	2	351.060	332.61*
A x C	2	2.339	2.22
B x C	4	146.020	138.34*
A x B x C	4	.923	<1
C x Subjects Within Groups	188	1.056	

* $p < .01$

Interpretation of these main effects is precluded however by the significant two-way interaction. The means for this interaction are displayed in Table 4. Scheffé post hoc multiple comparisons indicated that amnesics and nonamnesics did not differ on the number of items recalled before the suggestion or after it was cancelled. Thus, amnesics and nonamnesics were equivalent with respect to degree of original learning. On the recall trial during the suggestion period, nonamnesics recalled significantly more items than both partial and total amnesics. Moreover, partial amnesics recalled significantly more than total amnesics. Examining the means within Amnesia but across Recall Trials, it can be seen that the partial and total amnesics recalled significantly fewer items on the recall trial during the suggestion period compared to before the suggestion or after it was cancelled. In addition, they recalled significantly more items after the suggestion was cancelled compared to before the suggestion. Finally, the recall of nonamnesics did not vary significantly across the three recall trials.

Effect of susceptibility. Since there were not enough subjects to conduct a Conditions x Susceptibility x Amnesia ANOVA, two separate ANOVAs were carried out. Subjects were classified as low, medium, or high susceptible on the basis of their scores on the CURSS. The first analysis was a 2x3x3 split-plot ANOVA with two between-subjects variables

TABLE 4
Mean Recall Scores for Amnesia x Recall Trials
Interaction

Recall Trial	Amnesia					
	Partial		No		Total	
	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>
Before Suggestion	9.13 ¹ _a	1.34	9.33 ¹ _a	1.67	8.47 ¹ _a	1.85
During Suggestion	6.87 ¹ _b	1.75	9.76 ² _a	1.48	1.27 ³ _b	1.16
After Suggestion	10.28 ¹ _c	1.43	9.94 ¹ _a	1.58	10.00 ¹ _c	1.46

Note. Within a row, means sharing the same number superscript fail to differ significantly. Within a column, means sharing the same letter subscript fail to differ significantly. *n*'s = 39, 46, and 15 for the partial amnesics, nonamnesics, and total amnesics, respectively.

(Incidental/Intentional ~~Condition~~ x High/Medium/Low Susceptible) and one within-subjects variable (Recall Trials: Before/During/After the suggestion). The summary table is presented in Table 5. The statistically significant Recall Trial main effect is the same effect reported in the Conditions x Amnesia x Recall Trial analysis of recall scores. Comparisons of the means involved in the Susceptibility main effect using Scheffé's indicated that, overall, low susceptibles ($M = 9.44$, $sd = 2.13$, $n = 144$) recalled more items than high susceptibles ($M = 7.96$, $sd = 3.09$, $n = 66$). Neither group differed significantly from the mediums ($M = 8.58$, $sd = 2.44$, $n = 90$). This main effect was qualified by a statistically significant Susceptibility x Recall Trial interaction. The means are presented in Table 6. Scheffé post hoc comparisons indicated that medium and high susceptibles recalled fewer items on the recall trial during the suggestion period compared to before the suggestion and after it was cancelled. For the low susceptibles, the only significant difference involved the recall trials during the suggestion and after it was cancelled. The most important comparisons involve comparing recall across susceptibility levels on the trials before the suggestion and after it was cancelled. The absence of significant effects suggests that there were no baseline or posttest differences in amount recalled among subjects varying on susceptibility. On the recall trial during the

TABLE 5

Summary Table for Condition x Susceptibility (assessed on the
CURSS) x Recall Trial ANOVA on Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	7.796	1.09
Susceptibility (B)	2	53.934	7.54**
A x B	2	9.394	1.31
Subjects Within Groups	94	7.149	
Recall Trial (C)	2	204.180	57.87**
A x C	2	6.885	1.95
B x C	4	8.695	2.46*
A x B x C	4	.844	<1
C x Subjects Within Groups	188	3.528	

* $p < .05$

** $p < .01$

TABLE 6

Mean Recall Scores for Susceptibility (assessed on the CURSS) x
Recall Trial Interaction

Recall Trial	Susceptibility					
	Low		Medium		High	
	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>
Before Suggestion	9.50 ¹ _{ab}	1.31	8.93 ¹ _a	1.57	8.55 ¹ _a	1.99
During Suggestion	8.44 ¹ _a	2.95	6.87 ¹² _b	2.96	5.68 ² _b	3.64
After Suggestion	10.38 ¹ _b	1.21	9.93 ¹ _a	1.41	9.64 ¹ _a	1.87

Note. Within a row, means sharing the same number superscript fail to differ significantly. Within a column, means sharing the same letter subscript fail to differ significantly. n's = 48, 30, and 22 for Low, Medium, and High susceptibles, respectively.

suggestion period; low susceptibles recalled significantly more items than highs. None of the other means differed significantly.

The susceptibility differences on amount recalled during the suggestion period can most likely be attributed to amnesia, because amnesia is positively related to susceptibility. This interpretation is supported by the results of an Amnesia (Total+Partial/No) x Susceptibility (High/Medium/Low) x Recall Trial ANOVA on the same recall score data (see Table 7). When Amnesia and Susceptibility were crossed, susceptibility was not related to significant differences in amount recalled. The main effects for Amnesia and Recall Trials and their two-way interaction are the same effects reported for the Condition x Amnesia x Recall Trial ANOVA.

To summarize, the important finding was that recall differences between conditions occurred during the suggestion period and not before it or after it was cancelled.

Comparable analyses conducted with susceptibility scores obtained during the experimental session yielded a similar pattern of results. For these analyses, subjects were again classified as low, medium, or high susceptible. Table 8 presents the summary table for the Conditions x Susceptibility x Recall Trial split-plot ANOVA. The Recall Trial main effect was the same as that reported in previous

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TABLE 7

Summary Table for Amnesia x Susceptibility (assessed on the CURSS) x
Recall Trial ANOVA on Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Amnesia (A)	1	105.500	17.30*
Susceptibility (B)	2	16.889	2.77
A x B	2	6.294	1.03
Subjects Within Groups	94	6.097	
Recall Trial (C)	2	129.380	62.13*
A x C	2	128.340	61.63*
B x C	4	.444	<1
A x B x C	4	.303	<1
C x Subjects Within Groups	188	2.082	

* $p < .01$

TABLE 8

Summary Table for Condition x Susceptibility x Recall Trials
ANOVA on Recall Scores With Susceptibility Assessed
 During the Experiment

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	10.344	1.64
Susceptibility (B)	2	79.168	12.54*
A x B	2	19.058	3.02
Subjects Within Groups	94	6.312	
Recall Trial (C)	2	219.820	87.59*
A x C	2	1.820	<1
B x C	4	57.336	22.85*
A x B x C	4	1.256	<1
C x Subjects Within Groups	188	2.510	

* $p < .01$

analyses. Scheffé post hoc comparisons of the Susceptibility main effect indicated that, overall, low susceptibles ($M = 9.72$, $sd = 1.65$, $n = 123$) recalled significantly more items than medium ($M = 8.47$, $sd = 2.18$, $n = 87$) or high susceptibles ($M = 8.03$, $sd = 3.35$, $n = 90$). Medium and high susceptibles did not differ significantly. Again, this main effect was qualified by a statistically significant Susceptibility x Recall Trial interaction. The means which are presented in Table 9 were compared with Scheffé's. There were no statistically significant differences in recall on the trials before the suggestion and after it was cancelled for subjects varying in susceptibility. During the suggestion period, low and medium susceptibles recalled significantly more items than highs. Examining differences across recall trials but within levels of susceptibility, (a) there were no significant differences involving the low susceptibles, (b) mediums recalled significantly more items after the suggestion was cancelled compared to during the suggestion period, and (c) highs recalled significantly more items before the suggestion and after it was cancelled than during the suggestion period.

The summary table for the Amnesia x Susceptibility x Recall Trial split-plot ANOVA is presented in Table 10. The statistically significant main effects and two-way interaction involving Amnesia, Susceptibility, and Recall

TABLE 9

Mean Recall Scores for Susceptibility (assessed during Experiment)

Recall Trial Interaction

Recall Trial	Susceptibility					
	Low		Medium		High	
	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>
Before Suggestion	9.56 ¹ _a	1.55	8.41 ¹ _{ab}	1.52	9.2 ¹ _a	1.52
During Suggestion	9.37 ¹ _a	1.97	7.28 ¹ _a	2.45	4.7 ² _b	3.54
After Suggestion	10.24 ¹ _a	1.26	9.72 ¹ _b	1.77	10.2 ¹ _a	1.35

Note. Within a row, means sharing the same number superscript fail to differ significantly. Within a column, means sharing the same letter subscript fail to differ significantly. n 's = 41, 29, and 30 for Low, Medium, and High susceptibles, respectively.

TABLE 10

Summary Table for Amnesia x Susceptibility (assessed during
Experiment) x Recall Trial ANOVA on Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Amnesia (A)	1	76.368	12.87**
Susceptibility (B)	2	25.182	4.24*
A x B	2	5.800	<1
Subjects Within Groups	94	5.935	
Recall Trial (C)	2	95.432	61.25**
A x C	2	92.501	59.37**
B x C	4	9.112	5.85**
A x B x C	4	7.896	5.07**
C x Subjects Within Groups	188	1.558	

* $p < .05$

** $p < .01$

Trial are the same as those reported in previous analyses. Differences in level of recall during the suggestion period among amnesic subjects differing on susceptibility were responsible for the three-way interaction. Low susceptibles ($M = 7.75$, $sd = 2.34$, $n = 12$) recalled significantly more items than mediums ($M = 5.88$, $sd = 1.97$, $n = 17$), $t = 2.85$, or highs ($M = 3.76$, $sd = 3.00$, $n = 25$), $t = 6.55$. The difference between mediums and highs was also statistically significant, $t = 3.88$. Again, it is important to note the absence of differences in baseline or posttest levels of recall among conditions.

Rho Scores

Presentation order and recall order were correlated using the Spearman rank-order correlation coefficient. A separate rho score was obtained for each recall trial; before the suggestion, during it, and after it was cancelled.

Effects of condition and amnesia. The obtained rho scores varied from -1.00 to 1.00. All analyses were conducted first on these original obtained values and then on the absolute values. Although Evans and Kihlstrom distinguished between negative and positive values of rho in their work, it seems logical to conclude that a high negative rho is as indicative of temporal order (albeit in reverse) as a high positive rho.

(a) Analyses on obtained rho values. A 2x2x3 split-plot ANOVA with two between-subjects variables (Incidental/Intentional Condition x Partial/No Amnesia) and one within-subjects variable (Recall Trial: Before/During/After the suggestion) yielded two significant main effects; one for Condition and one for Recall Trial (see Table 11). Overall, the mean rho score obtained for the incidental condition ($\underline{M} = -.12$, $\underline{sd} = .42$, $\underline{n} = 126$) was significantly lower than that obtained for the intentional condition ($\underline{M} = .10$, $\underline{sd} = .41$, $\underline{n} = 129$). The means for the Recall Trial main effect were not ordered in a manner consistent with the disorganization hypothesis. Rho scores generally increased across recall trials. Post hoc comparisons using Newman-Keuls indicated that rho scores were significantly lower on the recall trial before the suggestion ($\underline{M} = -.08$, $\underline{sd} = .46$) than during it ($\underline{M} = .03$, $\underline{sd} = .43$), or after it was cancelled ($\underline{M} = .04$, $\underline{sd} = .40$). The means for the recall trials during the suggestion and after it was cancelled did not differ significantly. Moreover, the absence of an interaction between Amnesia and Recall Trial provides no evidence for an association between amnesia and disorganized recall.

(b) Analyses on absolute values of rho. Repetition of this analysis on the absolute values of rho yielded no statistically significant effects, again failing to confirm the disorganization hypothesis (see Table 12).

TABLE 11

Summary Table for Condition x Amnesia X Recall Trial

ANOVA on Obtained Rho Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	3.039	9.56**.
Amnesia (B)	1	.047	<1
A x B	1	.198	<1
Subjects Within Groups	81	.318	
Recall Trial (C)	2	.359	3.48*
A x C	2	.161	1.56
B x C	2	.041	<1
A x B x C	2	.095	<1
C x Subjects Within Groups	162	.103	

* $p < .05$ ** $p < .01$

TABLE 12

Summary Table for Condition x Amnesia x Recall Trial ANOVA
on the Absolute Values of Rho

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.016	<1
Amnesia (B)	1	.202	2.32
A x B	1	.03	<1
Subjects Within Groups	81	.087	
Recall Trial (C)	2	.078	1.83
A x C	2	.046	1.08
B x C	2	.046	1.09
A x B x C	2	.092	2.16
C x Subjects Within Groups	162	.043	

It might be argued that the presence of some relatively low rho scores on the first recall trial masked a disorganization effect for subjects with relatively high rho scores on the first trial. In order to investigate the possible impact of floor effects on the data, we calculated the median for the absolute values of rho on the recall trial before the suggestion ($M_d = .42$). Subjects who scored at or above the median were included in a further $2 \times 2 \times 3$ (Incidental/Intentional Condition $\times$ Partial/No Amnesia $\times$ Recall Trial) split-plot ANOVA on the absolute values of rho. The only statistically significant effect was a main effect for Recall Trial (see Table 13). Newman-Keuls post hoc comparisons indicated that the mean rho for the recall trial before the suggestion ($M = .59$, $sd = .14$) was significantly larger than the means for the recall trials during the suggestion ($M = .37$, $sd = .27$) and after it was cancelled ($M = .39$, $sd = .24$). The latter two means did not differ significantly. Thus, temporal organization decreased during the suggestion compared to before it but did not return to baseline levels when the suggestion was cancelled. It is particularly important to note that the Recall Trials $\times$ Amnesia interaction did not approach significance. In other words, the decrease in rho scores that occurred during the suggestion period was of equivalent magnitude for amnesic and nonamnesic subjects. This finding, together with the failure of the scores to return to baseline

TABLE 13

Summary Table for Condition x Amnesia x Recall Trial ANOVA on
 Absolute Values of Rho Using Subjects Who Scored at or above
 the Median on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.006	<1
Amnesia (B)	1	.003	<1
A x B	1	.223	2.75
Subjects Within Groups	39	.081	
Recall Trial (C)	2	.533	15.39*
A x C	2	.008	<1
B x C	2	.006	<1
A x B x C	2	.067	1.93
C x Subjects Within Groups	78	.035	

* $p < .01$

following cancellation of the suggestion, is inconsistent with the disorganization hypothesis.

Effect of susceptibility. Since Evans and Kihlstrom's results focussed on the relationship between recall organization and susceptibility, we conducted further analyses using susceptibility as a factor. Because of the distribution of amnesia across conditions, it was necessary to conduct separate analyses combining Condition and Susceptibility and collapsing across Amnesia and then combining Amnesia and Susceptibility and collapsing across Condition. Four 2x3x3 split-plot ANOVAs with two between-subjects variables (Incidental/Intentional Condition x High/Medium/Low Susceptible) and one within-subjects variable (Recall Trial) were conducted on the rho score data; (a) on the original values of rho and classifying subjects according to susceptibility assessed during the experimental session, (b) on the original values of rho and classifying subjects according to susceptibility assessed on the CURSS, (c) on the absolute values of rho with susceptibility assessed during the experimental session, and (d) on the absolute values of rho with susceptibility assessed on the CURSS. The only significant effects were the main effects for Condition and Recall Trial reported earlier. These occurred only when the original values of rho were considered. The summary tables for these analyses are presented in Appendix D.

Four 2x3x3 split-plot ANOVAs with two between-subjects variables (Partial/No Amnesia x High/Medium/Low Susceptible) and one within-subjects variable (Recall Trials) were conducted using the same four combinations of original/absolute values of rho and experimental session/CURSS susceptibility scores. Again, there were no statistically significant effects involving susceptibility. The main effect for Recall Trial was significant when using the original values of rho, as was reported earlier. The summary tables for these analyses are presented in Appendix D.

Two Susceptibility (High/Medium/Low) x Recall Trial (Before/During/After the suggestion) split-plot ANOVAs were also carried out on the rho score data for those subjects scoring at or above the median on the first recall trial. The first analysis classified subjects according to their susceptibility scores on the CURSS. The main effect for Recall Trial that was reported above was once again statistically significant (see Appendix D). There were no significant effects involving susceptibility. The second analysis classified subjects according to susceptibility scores obtained within the experimental session. Again, the main effect for Recall Trial was statistically significant. In addition, there was a significant main effect for Susceptibility (see Table 14). Scheffe post hoc comparisons indicated that, overall, the rho scores for low susceptibles

TABLE 14

Summary Table for Susceptibility (Experimental Session) x Recall
 Trial ANOVA on Rho-Scores Using Subjects Scoring above the
 Median

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Susceptibility (A)	2	.281	4.06*
Error	40	.069	
Recall Trial (B)	2	.704	20.46**
A x B	4	.025	<1
Error	80	.034	

* $p < .05$

** $p < .01$

($M = .54$, $sd = .23$, $n = 51$) were higher than those for high ($M = .40$, $sd = .26$, $n = 36$) and medium susceptibles ($M = .39$, $sd = .22$, $n = 42$). Highs and mediums failed to differ significantly. This analysis collapsed across amnesics and nonamnesics and thus does not provide support for the disorganization hypothesis of hypnotic amnesia.

Seriation Assessed by ARC

The equation for ARC and a brief explanation of its use are provided in Appendix D.

Effects of condition and amnesia. Analyses of ARC seriation scores were conducted only on subjects who obtained ARC scores above chance on the first recall trial (before the suggestion). The rationale for this elimination of subjects was similar to the one leading to the median split on the rho score data. Obviously, one would not expect decrements in organization across recall trials for subjects who do not organize initially. Following the elimination of subjects with zero and negative ARC scores on the first trial, 22 subjects remained in each of the incidental and intentional conditions.

A 2x2x3 split-plot ANOVA with two between-subjects variables (Incidental/Intentional Condition x Partial/No Amnesia) and one within-subjects variable (Recall Trial: Before/During/After the suggestion) revealed a statistically significant main effect for Recall Trial and a significant Condition x Amnesia x Recall Trial interaction (see Table

15). Newman-Keuls post hoc comparisons of the Recall Trial main effect indicated that, as for rho, ARC seriation scores were significantly higher on the recall trial before the suggestion ($M = .163$, $sd = .117$) than on the trials during it ($M = .030$, $sd = .207$) or after it was cancelled ($M = .021$, $sd = .173$). ARC scores during the suggestion and after it was cancelled failed to differ significantly.

The means for the Condition x Amnesia x Recall Trial interaction are presented in Table 16. A simple main effects analysis indicated that on the recall trial during the suggestion nonamnesics in the incidental condition obtained significantly higher ARC seriation scores than nonamnesics in the intentional condition. Moreover, within the intentional condition amnesics obtained significantly higher ARC scores than nonamnesics during the suggestion. In sum, the disorganization hypothesis predicts an amnesia-specific decrease in ARC scores from before to during the suggestion. This pattern of results was not obtained. The summary table of this analysis is presented in Table 15.

<u>Effect</u>	<u>of</u>	<u>susceptibility.</u>	Two	2
(Incidental/Intentional	Condition)	x 3	(High/Medium/Low	
Susceptible)	x 3	(Recall Trial)	split-plot	<u>ANOVAs</u> were
conducted on the <u>ARC</u> seriation scores of subjects scoring				
above chance on the first recall trial. The analyses				
differed only on whether susceptibility classifications were				

TABLE 15

Summary Table for Condition x Amnesia x Recall Trial ANOVA
on Seriation ARC Scores

Source	df	MS	F
Condition (A)	1	.0001	<1
Amnesia (B)	1	.045	1.14
A x B	1	.033	<1
Error	40	.040	
Recall Trial (C)	2	.240	10.36**
A x C	2	.012	<1
B x C	2	.006	<1
A x B x C	2	.083	3.60*
A x C at b_1	2	.042	1.81
A x C at b_2	2	.055	2.36
B x C at a_1	2	.038	1.62
B x C at a_2	2	.052	2.26
Error	80	.023	
A x B at c_1	1	.027	<1
A x B at c_2	1	.165	5.75*
A at bc_{12}	1	.055	1.90
A at bc_{22}	1	.122	4.26*
B at ac_{12}	1	.043	1.51
B at ac_{22}	1	.138	4.80*
A x B at c_3	1	.011	<1
Pooled Error	120	.029	

* $p < .05$ ** $p < .01$

TABLE 16

Mean Seriation ARC Scores/for Condition x Amnesia x Recall
Trial Interaction

	Amnesia		No Amnesia	
	Incidental Condition			
Recall Trial	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>
Before Suggestion	.203	.112	.138	.147
During suggestion	.006	.54	.095	.226
After Suggestion	.026	.183	-.015	.166
	<u>n</u> = 12		<u>n</u> = 10	
	Intentional Condition			
Before Suggestion	.132	.107	.168	.105
During Suggestion	.109	.304	-.052	.129
After Suggestion	.084	.204	0.000	.153
	<u>n</u> = 9		<u>n</u> = 13	

based on CURSS scores or scores obtained within the experimental session. In both cases, there were no statistically significant effects involving susceptibility (see Table 17). The only significant effect was the main effect for Recall Trial reported above.

TABLE 17

Summary Tables for Condition x Susceptibility x Recall Trial
ANOVAs on Seriation ARC Scores

Classifying Subjects on CURSS Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.011	<1
Susceptibility (B)	2	.007	<1
A x B	2	.048	1.20
Error	38	.40	
Recall Trial (C)	2	.262	10.65*
A x C	2	.0002	<1
B x C	4	.017	<1
A x B x C	4	.033	1.36
Error	76	.025	

Classifying Subjects on Scores Obtained During Experimental Session

Condition (A)	1	.010	<1
Susceptibility (B)	2	.062	1.60
A x B	2	.002	<1
Error	38	.039	
Recall Trial (C)	2	.253	9.98*
A x C	2	.007	<1
B x C	4	.012	<1
A x B x C	4	.021	<1
Error	76	.025	

* $p < .01$

Subjective Organization ARC Scores

Effects of condition and amnesia. ARC scores were obtained for two pairs of recall trials: (a) before the suggestion and during it and (b) before the suggestion and after it was cancelled. A 2 (Incidental/Intentional Condition) x 2 (Partial/No Amnesia) x 2 (Recall Trial Pair: Before-During/Before-After) split-plot ANOVA yielded no statistically significant effects (see Table 18).

Effect of susceptibility. Two Condition x Susceptibility x Recall Trial Pair split-plot ANOVAs also yielded no statistically significant effects (see Table 19).

Amnesia, Serial Position and Item Type

Analyses were conducted to determine whether subjects' amnesia was selective for certain serial positions and types of items. For the analysis of serial position effects each partial amnesic received three proportion scores; (a) the number of times amnesic for an item in positions 1 through 4 divided by 4, (b) the number of times amnesic for an item in positions 5 through 8 divided by 4, and (c) the number of times amnesic for an item in positions 9 through 12 divided by 4. A one-way repeated measures ANOVA on the arc-sine transformed proportion scores yielded a significant main effect for serial position, $F(2,76) = 4.53$, $p < .05$. Newman-Keuls post hoc comparisons indicated that subjects showed significantly more amnesia for items presented in the middle ($M = .89$, $sd = .67$) and end ($M = .86$, $sd = .75$) than

TABLE 18

Summary Table for Condition x Amnesia x Recall Trial ANOVA on
Subjective Organization ARC Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.010	<1
Amnesia (B)	1	.075	1.17
A x B	1	.012	<1
Error	81	.064	
Recall Trial Pair (C)	1	.007	<1
A x C	1	.018	<1
B x C	1	.001	<1
A x B x C	1	.015	<1
Error	81	.032	

Summary Tables for Condition x Susceptibility x Recall Trial
ANOVAs on Subjective Organization ARC Scores

Classifying Subjects on CURSS Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.002	<1
Susceptibility (B)	2	.084	1.32
A x B	2	.034	<1
Error	79	.063	
Recall Trial (C)	1	.035	1.11
A x C	1	.003	<1
B x C	2	.040	1.28
A x B x C	2	.031	<1
Error	79	.032	

Classifying Subjects on Scores Obtained During Experimental Session

Condition (A)	1	.0001	<1
Susceptibility (B)	2	.048	<1
A x B	2	.087	1.38
Error	79	.063	
Recall Trial (C)	1	.004	<1
A x C	1	.018	<1
B x C	2	.011	<1
A x B x C	2	.007	<1
Error	79	.033	

for items presented at the beginning ($\bar{M} = .46$, $\underline{sd} = .65$). There was no significant difference between the means for the middle and end positions.

A similar analysis was conducted for item type. The twelve suggestions were collapsed into motor, challenge, and cognitive categories, and the proportion of 'amnesia' for items within each category was obtained. A one-way ANOVA on the proportions transformed with an arc-sine transformation yielded a significant effect for item type, $F(2,76) = 10.71$, $p < .01$). Newman-Keuls post hoc comparisons indicated that subjects showed significantly less amnesia for cognitive items ($\bar{M} = .38$, $\underline{sd} = .55$) than for motor ($\bar{M} = 1.21$, $\underline{sd} = 1.22$) or challenge ($\bar{M} = .87$, $\underline{sd} = .50$) items. The means for the challenge and motor items did not differ significantly.

Discussion

According to the disorganization hypothesis (a) partial amnesics should show a significant decrease in the organization of recall on the trial during the suggestion compared to before the suggestion or after it was cancelled and (b) nonamnesics should show no change in organization across these three recall trials. The results of this experiment failed to support either of these predictions.

A significant decrease in absolute rho scores from before to during the suggestion period was found for subjects who obtained rho scores at or above the median on the first recall trial. This disorganization was unrelated

to amnesia. Amnesics and nonamnesics showed an equivalent decrease in absolute rho scores during the suggestion period. Moreover, absolute rhos did not increase on the recall trial after the suggestion was cancelled as one would expect if the decrease was specific to amnesia.

A similar pattern of results emerged when seriation was assessed by the ARC measure, and subjects with scores below chance on the first trial were eliminated. ARC scores decreased significantly from before the suggestion to during it. As with rho, there was no significant increase after the suggestion was cancelled. This main effect was complicated by a three-way interaction of treatment condition, amnesia condition, and recall trial. Nonetheless, further analysis of the interaction indicated that the significant differences between treatment conditions involved the nonamnesics and that the one difference involving amnesics and nonamnesics was opposite to prediction. In the intentional condition, amnesics obtained higher, ARC scores than nonamnesics during the suggestion period. Thus, the results for ARC scores complement those obtained with rho scores. In neither case did the evidence indicate an amnesia specific "breakdown" in serial organization.

Hypnotic susceptibility measured during the experimental session was negatively related to rho. Low susceptibles obtained significantly higher rho scores than

medium and high susceptibles. Nevertheless, these differences were not related to amnesia and were not specific to recall during the suggestion period. In other words, high susceptible hypnotic subjects obtained lower rho scores than low susceptibles regardless of whether they received an amnesia suggestion or showed amnesia during the suggestion period. These findings are consistent with work by Evans and Kihlstrom and Schwartz (Evans & Kihlstrom, 1973; Kihlstrom & Evans, 1979; Schwartz, 1978, Note 3). However they call into question the interpretation Evans and Kihlstrom placed on their findings. Those investigators, it will be recalled, measured rho only during an amnesia trial. They concluded that differences in rho between high and low susceptibles on this trial reflected amnesia. The present findings indicate instead that amnesia and rho are unrelated and that differences in rho between high and low susceptibles are a function of factors that operate independently of amnesia or the administration of amnesia suggestions.

No statistically significant effects involving susceptibility were found when susceptibility was assessed on the CURSS in a second session. Evans and Kihlstrom and Schwartz typically assessed susceptibility and recall organization within a single experimental session. Thus, the absence of susceptibility effects involving CURSS scores is not inconsistent with previous work. These results do

suggest however that the factor underlying the relationship between susceptibility and recall organization is situation-specific.

Although susceptibility measured during the experimental session was negatively related to rho scores, it was unrelated to ARC scores. The ARC measure is less affected by the number of items recalled than the rho measure. When susceptibility classifications were based on scores obtained during the experimental session, low susceptibles recalled more items than medium and high susceptibles even when amnesia was taken into account. Thus, it is possible that differences in amount recalled were, at least in part, responsible for the rho differences between high and low susceptibles. Because ARC statistically removes the effect of amount recalled, there were no differences in ARC as a function of susceptibility.

Analyses of subjective organization indicated that organization on the before-after recall trial pair was not significantly higher than organization on the before-during pair. This is not particularly suprising, in light of Pellegrino and Battig's (1974) finding that subjective organization begins to build up only after the first few recall trials. Thus, our subjects may not have attained sufficiently high initial levels of subjective organization to allow an adequate test of the disorganization hypothesis.

As expected, amnesia was positively related to susceptibility as assessed both during the experimental session and on the CURSS. Amnesics scored higher on hypnotic susceptibility than nonamnesics. Amnesia however was not related to original learning; amnesics and nonamnesics did not differ on recall before the suggestion or after it was cancelled. Learning conditions also failed to exert any major influence on amount of recall, amnesia, or organization.

It is interesting to note that subjects were least likely to be amnesic for test suggestions presented early in the session. In addition, subjects were selectively amnesic for motor and challenge items and showed significantly less amnesia for cognitive items. Both motor and challenge items have, as their major component, an overt limb movement. Together, these constituted three-quarters of the test items. The four cognitive items were relatively distinct from one another as well as from the motor and challenge items. Thus, the cognitive items may have been particularly resistant to amnesia because they were distinctive. This hypothesis is, of course, highly speculative. These results are exploratory in nature. They require replication to assess their reliability. To date, only a few studies have assessed the characteristics of amnesics items and these have mostly focussed on whether the items were passed or failed (Clemes, 1964; Hilgard & Hommel, 1961; O'Connell,

1966; Petinatti, 1979; Petinatti & Evans, 1978; Spanos, Radtke-Bodorik, & Shablinsky, 1980; Stam, Radtke-Bodorik, & Spanos, 1980). If the results bear replication, this type of investigation might provide a valuable link between hypnotic amnesia research and memory research more broadly defined. The memorability of items may influence the ease with which they are subject to amnesic processes.

In conclusion, the methodological improvements in the susceptibility-scale paradigm did not result in findings comparable to those found in the word-list paradigm. Nor did learning set have any major impact on the results. Clearly, other factors are responsible for the discrepant findings of the two experimental paradigms.

EXPERIMENT 2

As mentioned previously, the susceptibility-scale and word-list paradigms differ on a number of dimensions. In the susceptibility-scale paradigm, the items are presented once and under incidental learning conditions. Moreover, what exactly constitutes a to-be-recalled item is a source of ambiguity. On the other hand, under the word-list paradigm, the items are rehearsed to a stringent criterion before the amnesia suggestion is presented. Thus, the task clearly involves intentional learning. Furthermore, there is no discrepancy between what subjects and experimenters identify as to-be-recalled items. The purpose of Experiment 2 was to study hypnotic amnesia using the word-list paradigm while varying the experimental conditions so that they resembled those under the susceptibility-scale paradigm.

As in Experiment 1, subjects were randomly assigned to either an intentional or incidental recall condition. This enabled us to assess the effects of recall condition on amnesia performance when the critical material was a list of words. The list was presented once, and subjects were required to rate the imagery value of each word as it was presented. Thus, under intentional recall conditions subjects were told that following list presentation and imagery rating they would recall the words. Subjects in the incidental condition were not provided with this information.

The word list was composed of 12 words so that the number of items to-be-recalled in Experiments 1 and 2 was constant. Similarly, as in Experiment 1 each subject received a different presentation order. One-half of the words had high imagery values and one-half had low imagery values. This allowed us to assess how the imagery value of the words was related to amnesia performance.

Again, subjects were tested on hypnotic susceptibility, thereby enabling examination of the relationship between susceptibility and amnesia performance.

The procedures followed enabled us to compare the pattern of results obtained in Experiments 1 and 2. In this manner we could determine whether disorganization is paradigm-specific, stimulus-specific, both, or neither. Likewise, we could compare the relative effects of recall conditions on amnesia for the two types of stimuli. Moreover, we could assess whether the parameters for amnesia (e.g., amount of amnesia, reversibility, relationship with susceptibility) were comparable under the two paradigms.

Method

Subjects

Subjects were 100 Carleton University undergraduate volunteers (68 females, 32 males; ages 18-40) recruited for an experiment involving hypnosis and imagery. They received course credit for their participation. None of the subjects had previously participated in an experiment involving hypnosis.

Materials

Th~~e~~ twelve words were selected from the norms of Toglia and Battig (1978). They are presented in Appendix E, together with their mean ratings and standard deviations on imagery, concreteness, categorizability, familiarity, meaningfulness, number of attributes, and pleasantness. Six have relatively high imagery ratings and six have low ratings. A different random ordering of the words was determined for each subject.

Procedure

Experimental session. Subjects were randomly assigned to a list order and to an incidental or intentional recall condition. All were administered the hypnotic induction procedure used in Experiment 1 (see Appendix B). In this case, however, the procedure was tape-recorded.

Following the hypnotic induction procedure, subjects were asked to open their eyes but to remain hypnotized. They were then administered instructions for the imagery rating tasks. All instructions including the amnesia suggestion were tape-recorded. The instructions for the imagery task were adapted from those used by Toglia and Battig (1978). (See Appendix F). Subjects in the intentional condition were explicitly informed of the recall task to follow. The words were presented one at a time on a memory drum. Each word was presented for 3 sec, and subjects were allowed an additional 3 sec to make their

ratings. Subjects pronounced each word as it appeared in the window of the memory drum.

Following the rating task, all subjects were asked to write down as many of the words as they could remember. They were allowed one minute for recall. Next, the amnesia suggestion and waking suggestions used in Experiment 1 (but adapted for words as the target material) were administered. Subjects were given another one minute recall trial, the suggestion was cancelled, and subjects again had one minute in which to recall the words. The verbatim instructions are provided in Appendix F.

Amnesia was scored as in Experiment 1, and recall organization was assessed with the same three measures.

Susceptibility testing. Subjects were administered a tape-recorded version of the CURSS in small groups of 5 to 10.

Results

Susceptibility

Subjects' CURSS scores were submitted to a 2x3 (Incidental/Intentional Condition x Total/Partial/No Amnesia) factorial ANOVA. Neither the main effects nor the interaction achieved statistical significance (see Table 20). A priori t-tests indicated no statistically significant differences among the means for partial amnesics ($\bar{M} = 2.97$, $sd = 1.78$, $n = 38$), nonamnesics ($\bar{M} = 2.71$, $sd = 1.85$, $n = 51$), and total amnesics ($\bar{M} = 3.82$, $sd = 1.99$, $n = 11$).

TABLE 20

Summary Table for Condition x Amnesia ANOVA on Susceptibility

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	2.32	<1
Amnesia (B)	2	6.84	2.06
A x B	2	2.61	<1
Error	94	3.32	

Amnesia

A one-way ANOVA indicated no statistically significant difference in the amount of amnesia between subjects in the incidental ($\underline{M} = 1.12$, $\underline{sd} = 1.29$) and intentional ($\underline{M} = 1.02$, $\underline{sd} = 1.92$) conditions, $F(1,98) < 1$.

Table 21 shows the number of amnesic and nonamnesic subjects in each condition. A Chi-square test of association indicated no statistically significant relationship between Condition and Amnesia, $\chi^2(1) = 3.42$.

Recall

Effect of condition and amnesia. A 2x3x3 split-plot ANOVA with two between-subjects variables (Incidental/Intentional Condition x Partial/No/Total Amnesia) and one within-subjects variable (Recall Trial: Before/During/After the suggestion) yielded statistically significant main effects for Amnesia and Recall Trial as well as a significant Amnesia x Recall Trial interaction (see Table 22).

Scheffé post hoc comparisons of the main effects indicated that (a) overall, total amnesics ($\underline{M} = 4.79$, $\underline{sd} = 2.77$, $\underline{n} = 33$) recalled significantly fewer words than partial amnesics ($\underline{M} = 7.31$, $\underline{sd} = 1.66$, $\underline{n} = 114$) or nonamnesics ($\underline{M} = 7.72$, $\underline{sd} = 1.66$, $\underline{n} = 153$), (b) the means for partial amnesics and nonamnesics did not differ significantly, (c) overall, subjects recalled significantly fewer words during the suggestion ($\underline{M} = 6.42$, $\underline{sd} = 2.42$) than

TABLE 21

Frequency of Amnesia by Experimental Condition

Amnesia	Incidental	Intentional
No	23	28
Partial	22	16
Total	5	6

TABLE 22

Summary Table for Condition x Amnesia x Recall Trials

ANOVA on Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	7.34	1.26
Amnesia (B)	2	169.06	29.02*
A x B	2	1.93	<1
Error	94	5.83	
Recall Trials (C)	2	109.96	153.34*
A x C	2	1.4312	2.00
B x C	4	45.83	63.91*
A x B x C	4	1.57	2.18
Error	188	.717	

* $p < .001$

before it ($M = 7.78$, $sd = 1.56$) or after it was cancelled ($M = 7.52$, $sd = 1.69$), and (d) mean recall before the suggestion and after it was cancelled did not differ significantly.

The means for the two-way interaction are displayed in Table 23. Scheffé post hoc comparisons indicated that amnesics and nonamnesics did not differ on amount recalled before the suggestion and after it was cancelled. During the suggestion period, all three groups differed significantly with nonamnesics recalling the most, partial amnesics recalling fewer, and total amnesics recalling the least. Looking across recall trials, amnesics recalled significantly more words before the suggestion and after it was cancelled compared to during the suggestion. Nonamnesics' recall did not differ significantly across recall trials.

Effect of susceptibility. A 2 (Incidental/Intentional Condition) x 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVA yielded no significant effects involving susceptibility (see Table 24). The only significant effect was the main effect for Recall Trial reported above.

A further 2 (Total+Partial/No Amnesia) x 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVA again produced no significant effects involving susceptibility (see Table 24). The significant main effects

TABLE 23

Mean Recall Scores for Amnesia x Recall Trials

Interaction

Recall Trial	Amnesia					
	Partial		No		Total	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Before Suggestion	8.03 ¹ _a	1.28	7.84 ¹ _a	1.69	6.64 ¹ _a	1.43
During Suggestion	6.08 ¹ _b	1.48	7.75 ² _a	1.59	1.46 ³ _b	0.82
After Suggestion	7.82 ¹ _a	1.49	7.57 ¹ _a	1.71	6.27 ¹ _a	1.85

Note. Within a row, means sharing the same number superscript fail to differ significantly. Within a column, means sharing the same letter subscript fail to differ significantly. N's = 38, 51, and 11 for the partial amnesics, nonamnesics, and total amnesics, respectively.

TABLE 24

Summary Table for Condition x Susceptibility x Recall Trial ANOVA
on Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	6.543	<1
Susceptibility (B)	2	1.236	<1
A x B	2	15.847	2.02
Error	94	7.830	
Recall Trials (C)	2	53.772	33.73*
A x C	2	.231	<1
B x C	4	2.253	1.41
A x B x C	4	1.858	1.17
Error	188	1.594	

Summary Table for Amnesia x Susceptibility x Recall Trial ANOVA
on Recall Scores

Amnesia (A)	1	82.297	11.22*
Susceptibility (B)	2	3.763	<1
A x B	2	5.738	<1
Error	94	7.334	
Recall Trials (C)	2	46.411	47.89*
A x C	2	50.914	52.53*
B x C	4	1.752	1.81
A x B x C	4	1.950	2.01
Error	188	.969	

* $p < .001$

for Amnesia and Recall Trial and the two-way interaction are the same as those reported above.

Rho Scores

As before, analyses were performed separately on the obtained and absolute values.

Effects of condition and amnesia. (a) Obtained rho scores. A 2 (Incidental/Intentional Condition) x 2 (Partial/No Amnesia) x 3 (Recall Trial) split-plot ANOVA on the obtained values of rho resulted in trends for the main effects involving Condition and Recall Trial and the interaction of Amnesia and Recall Trial (see Table 25). Since the trends were consistent with significant effects obtained in Experiment 1, they were analyzed further. Overall, the mean rho scores for the incidental condition ($M = -.05$, $sd = .48$, $n = 135$) was lower than that obtained for the intentional condition ($M = .11$, $sd = .47$, $n = 129$). A priori t-tests indicated that, overall, rho scores were significantly lower on the recall trial before the suggestion ($M = -.04$, $sd = .50$) than after the suggestion was cancelled ($M = .08$, $sd = .47$), $t(168) = 2.14$. Mean rho during the suggestion ($M = .04$, $sd = .46$) did not differ significantly from the other two.

The means for the Amnesia x Recall Trial interaction are presented in Table 26. They were not examined further since, contrary to the disorganization hypothesis, both amnesics and nonamnesics showed an increase in mean rho on

TABLE 25

Summary Table for Condition x Amnesia x Recall Trials

ANOVA on Obtained Rho Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	1.225	3.50
Amnesia (B)	1	.686	1.96
A x B	1	.702	2.00
Error	84	.350	
Recall Trials (C)	2	.441	2.79
A x C	2	.170	1.08
B x C	2	.469	2.96
A x B x C	2	.107	.68
Error	168	.158	

TABLE 26
 Mean Obtained Rho Scores for Amnesia x Recall Trials
 Interaction

Recall Trial	Amnesia			
	Partial		No	
	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>
Before Suggestion	-.172	.474	.055	.506
During Suggestion	-.054	.530	.115	.422
After Suggestion	.110	.462	.063	.471
	<u>n</u> = 38		<u>n</u> = 50	

the recall trial during the suggestion compared to before it.

(b) Absolute values of rho. Repetition of this analysis on the absolute values of rho yielded a statistically significant interaction of Condition and Recall Trial (see Table 27). An analysis of simple main effects indicated a significant effect for Condition during the suggestion period; mean rho was lower in the incidental than in the intentional condition. None of the other effects reached statistical significance. The means are presented in Table 28 and the summary of simple main effects in Table 27.

Subjects who scored at or above the median level of the absolute values of rho ($M_d = .40$) on the first recall trial (i.e., before the suggestion) were included in a further $2 \times 2 \times 3$ (Incidental/Intentional Condition) $\times$ 2 (Partial/No Amnesia) $\times$ 3 (Recall Trial) split-plot ANOVA on the rho scores. As in Experiment 1, the only effect to achieve statistical significance was the Recall Trial main effect (see Table 29). Newman-Keuls post hoc comparisons indicated that the mean rho for the recall trial before the suggestion ($M = .65$, $sd = .14$) was significantly larger than the means for the recall trials during the suggestion ($M = .38$, $sd = .30$) and after it was cancelled ($M = .37$, $sd = .24$). The latter two means did not differ significantly. Once again, it should be noted that the Amnesia $\times$ Recall Trial interaction

TABLE 27

Summary Table for Condition x Amnesia x Recall Trials ANOVA
on Absolute Values of Rho Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.001	<1
Amnesia (B)	1	.022	<1
A x B	1	.030	<1
Error	84	.075	
Recall Trials (C)	2	.027	<1
A x C	2	.266	3.94*
C at a_1	2	.189	2.81
C at a_2	2	.110	1.62
A at c_1	1	.057	<1
A at c_2	1	.366	5.22*
A at c_3	1	.084	1.20
Pooled Error	258	.070	
B x C	2	.100	1.49
A x B x C	2	.089	1.32
Error	168	.068	

*p<.05

TABLE 28

Mean Rho Scores for Condition x Recall Trials Interaction

Recall Trial	Condition			
	Incidental		Intentional	
	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>
Before Suggestion	.454	.257	.403	.266
During Suggestion	.328	.255	.457	.276
After Suggestion	.418	.285	.356	.247

TABLE 29

Summary Table for Condition x Amnesia x Recall Trial ANOVA
 on Absolute Values of $\bar{R}_h$ Using Subjects Who Scored
 at or above the Median on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.138	1.91
Amnesia (B)	1	.025	<1
A x B	1	.006	<1
Error	41	.072	
Recall Trials (C)	2	1.013	20.64*
A x B	2	.022	<1
B x C	2	.071	1.44
A x B x C	2	.019	<1
Error	82	.049	

* $p < .001$

did not approach significance. Thus, contrary to the disorganization hypothesis, the decrease in rho scores across recall trials was not specific to amnesic subjects.

Effect of susceptibility. A 2 (Incidental/Intentional Condition) x 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVA on the obtained values of rho yielded one statistically significant effect, the Condition main effect reported earlier (see Table 30). The same analysis conducted on the absolute values of rho also produced one marginally significant effect, the Condition x Recall Trial interaction that was reported earlier (see Table 30). Hence, there were no significant effects involving susceptibility.

Two 2 (Partial/No Amnesia) x 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVAs, one conducted on the obtained values of rho and the other on the absolute values yielded no statistically significant effects (see Table 31).

A Susceptibility x Recall Trial split-plot ANOVA including only subjects who scored at or above the median for rho on the first recall trial yielded one statistically significant effect, the Recall Trial main effect reported earlier (see Table 32). There were no significant effects involving susceptibility.

TABLE 30

Summary Table for Condition x Susceptibility x Recall Trials ANOVA
on Obtained Rho Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	2.528	7.05*
Susceptibility (B)	2	.401	1.12
A x B	2	.424	1.18
Error	82	.359	
Recall Trials (C)	2	.292	1.76
A x C	2	.130	<1
B x C	4	.112	<1
A x B x C	4	.009	<1
Error	164	.166	

* $p < .01$

Summary Table for Condition x Susceptibility x Recall Trials ANOVA
on Absolute Values of Rho Scores

Condition (A)	1	0.000	0.000
Susceptibility (B)	2	.031	<1
A x B	2	.016	<1
Error	82	.076	
Recall Trials (C)	2	.039	<1
A x C	2	.213	3.03*
B x C	4	.014	<1
A x B x C	4	.024	<1
Error	164	.070	

* $p < .06$

TABLE 31

Summary Table for Amnesia x Susceptibility x Recall Trials ANOVA
on Obtained Rho Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Amnesia (A)	1	1.158	3.11
Susceptibility (B)	2	.142	<1
A x B	2	.534	1.43
Error	82	.372	
Recall Trials (C)	2	.407	2.54
A x C	2	.431	2.69
B x C	4	.087	<1
A x B x C	4	.134	<1
Error	164	.160	

Summary Table for Amnesia x Susceptibility x Recall Trials ANOVA
on Absolute Values of Rho Scores

Amnesia (A)	1	.050	<1
Susceptibility (B)	2	.083	1.14
A x B	2	.157	2.16
Error	82	.073	
Recall Trials (C)	2	.037	<1
A x C	2	.051	<1
B x C	4	.043	<1
A x B x C	4	.130	1.86
Error	164	.070	

TABLE 32

Summary Table for Susceptibility x Recall Trials ANOVA on
Rho Scores Using Subjects Who Scored at or above
the Median on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Susceptibility (A)	2	.036	<1
Error	42	.078	
Recall Trials (B)	2	1.044	20.52*
A x B	4	.013	<1
Error	84	.051	

* $p < .001$

Seriation Assessed by ARC

Effects of condition and amnesia. Subjects who obtained ARC scores above chance on the first recall trial (before the suggestion) were included in a 2 (Incidental/Intentional Condition) x 2 (Partial/No Amnesia) x 3 (Recall Trial) split-plot ANOVA on ARC scores. Two effects achieved statistical significance, the Condition x Amnesia interaction and the Recall Trial main effect (see Table 33). Newman-Keuls post hoc comparisons indicated that, as in Experiment 1, the mean ARC on the recall trial before the suggestion ($M = .193$, $sd = .113$) was significantly higher than the means on the recall trials during the suggestion ($M = .042$, $sd = .194$) and after it was cancelled ($M = .055$, $sd = .205$). The means for the Condition x Amnesia interaction are presented in Table 34. Scheffe post hoc comparisons indicated that none of the pair-wise comparisons were statistically significant. This interaction collapses across recall trials and, therefore, does not bear on the disorganization hypothesis.

Effect of susceptibility. A 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVA on the ARC scores of subjects scoring above chance on the first recall trial revealed no statistically significant effects involving susceptibility (see Table 35). The same Recall Trial main effect reported above was again significant.

TABLE 33

Summary Table for Condition x Amnesia x Recall Trials ANOVA for
ARC Seriation Scores Using Subjects Who Scored above
Chance Levels on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.021	<1
Amnesia (B)	1	.0008	<1
A x B	1	.344	7.08*
Error	44	.049	
Recall Trials (C)	2	.320	16.29**
A x C	2	.037	1.86
B x C	2	.005	<1
A x B x C	2	.008	<1
Error	88	.020	

* $p < .05$

** $p < .001$

TABLE 34

Mean ARC Seriation Scores for Condition $\times$ Amnesia Interaction

Amnesia	Condition					
	Incidental			Intentional		
	<u>M</u>	<u>sd</u>	<u>n</u>	<u>M</u>	<u>sd</u>	<u>n</u>
Partial	.149	.212	42	.020	.151	21
No	.041	.156	30	.118	.179	51

TABLE 35

Summary Table for Susceptibility x Recall Trials ANOVA on ARC
 Seriation Scores Using Subjects Who Scored above
 Chance Levels on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Susceptibility (A)	2	.020	<1
Error	45	.055	
Recall Trials (B)	2	.326	16.15*
A x B	4	.008	<1
Error	90	.020	

* $p < .001$

Subjective Organization ARC Scores

Effect of condition and amnesia. As in Experiment 1, a 2 (Incidental/Intentional Condition) x 2 (Partial/No Amnesia) x 2 (Recall Trial Pair) split-plot ANOVA yielded no statistically significant effects (see Table 36).

Effect of susceptibility. A Condition x Susceptibility x Recall Trial Pair split-plot ANOVA yielded a marginally significant effect for Recall Trial Pair (see Table 37). The mean for the Before-After recall trial pair ($M = .18$, $sd = .25$) tended to be larger than the mean for the Before-During recall trial pair ($M = .13$, $sd = .26$). Once again, it should be noted that this effect was collapsed across level of susceptibility and, therefore, of little relevance to the disorganization hypothesis.

Amnesia and Serial Position and Item Type

As in Experiment 1, proportion scores for serial positions 1 through 4, 5 through 8, and 9 through 12 were calculated for each subject. A one-way ANOVA on the proportions transformed using an arc-sine transformation did not reach statistical significance, $F(2,74) = 1.09$. Moreover, the order of the means differed from that obtained in Experiment 1. In this experiment, subjects showed more amnesia for words in the end positions ($M = .65$, $sd = .65$), than for those at the beginning ($M = .51$, $sd = .64$), and the least for those in the middle ($M = .41$, $sd = .57$).

TABLE 36

Summary Table for Condition x Amnesia x Recall Trials ANOVA on
ARC Subjective Organization Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.018	<1
Amnesia (B)	1	.035	<1
A x B	1	.090	1.00
Error	84	.090	
Recall Trials (C)	1	.112	2.61
A x C	1	.128	2.98
B x C	1	.049	1.14
A x B x C	1	.011	<1
Error	84	.043	

TABLE 37

Summary Table for Condition x Susceptibility x Recall Trial
ANOVA on ARC Subjective Organization Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.007	<1
Susceptibility (B)	2	.048	<1
A x B	2	.130	1.46
Error	82	.090	
Recall Trials (C)	1	.171	3.92*
A x C	1	.054	1.23
B x C	2	.038	<1
A x B x C	2	.048	1.10
Error	82	.044	

* $p < .10$

The words in this experiment were selected for their high and low imagery properties. A tendency for subjects to selectively show amnesia for high or low imagery words was tested with a one-way ANOVA, performed once again on arc-sine transformed proportions. Subjects did not show different degrees of amnesia for low ($M = .50$, $sd = .49$) and high imagery words, ($M = .67$, $sd = .60$), $F(1,37) = 1.09$.

Discussion

Overall, the results for Experiment 2, like those of Experiment 1, do not support the disorganization hypothesis. Again, subjects with initially high rho scores showed significant decreases in the absolute values of rho during the suggestion. However, these decreases were unrelated to amnesia or susceptibility. Also, there was no increase in rho after the suggestion was cancelled. A similar effect was obtained for the ARC measure. ARC scores decreased significantly during the suggestion compared to before it and did not increase again once the suggestion was cancelled. The decrease was not associated with amnesia or susceptibility. In addition, no significant differences in subjective organization were detected across recall trials.

Unfortunately, the results concerning serial position did not confirm earlier findings. Subjects were not selectively amnesic for items in certain serial positions. Moreover, amnesia was not related to the imagery values of the words. Subjects were equally likely to be amnesic for

high and low imagery words, replicating findings reported earlier by Spanos, Radtke-Bodorik, and Shabinsky (1980).

It was surprising to find no differences between amnesics and nonamnesics on susceptibility. Correlations between susceptibility and amnesia, although not large ($r = .30$), have been obtained consistently. On the other hand, this is the first study to investigate amnesia for a word list presented for only a single trial. Under these conditions recall may well be unstable; that is, there may be considerable variability in the items recalled across repeated trials. Our criterion for amnesia was relatively stringent and required amnesic items to be recalled before and after the suggestion but not during it. Nevertheless, some of the items counted as amnesic may instead have reflected temporary fluctuations in accessibility that were unrelated to amnesia. In short, amnesia may have been confounded with temporary memory lapses associated with partial learning. Such memory lapses would not be expected to correlate with susceptibility. Hence, the confounding of temporary memory lapses with amnesia might reduce the apparent relationship between amnesia scores and susceptibility.

As expected, amnesics and nonamnesics did not differ on original learning, and learning set did not generally affect amount of recall, amnesia, or organization. Comparisons between experiments will be made in the general overview section following Experiment 3.

In short, when the word-list paradigm was modified to resemble the susceptibility-scale paradigm, there was no evidence of a disorganization effect associated with hypnotic amnesia.

EXPERIMENT 3

The final experiment assessed the effect of a learning criterion on amnesia and disorganization. The susceptibility-scale paradigm has always involved a single presentation of the critical material while the word-list paradigm has usually required that the material be learned to a stringent criterion. Disorganization during amnesia may be partly dependent on subjects' awareness of their organizational strategies during list learning. In the case of multiple list presentations, subjects have more exposure to the recall process and therefore might be expected to be more aware of their strategies. If so, more disorganization might be expected in the multiple presentation situation.

Alternatively, multiple presentation of recall trials might enhance baseline or preamnesia levels of organization. If subjects organize relatively little with only a single presentation, a floor effect might effectively prevent any disorganization during amnesia.

Seriation is typically enhanced by presenting the items in the same order for a number of trials (Mandler & Dean, 1969; Pellegrino & Battig, 1974). Thus, in this experiment we compared amnesia following either a single list presentation before the amnesia suggestion or learning the list to a strict criterion before the suggestion. The criterion was the same as that used in most past studies involving the word-list paradigm, i.e., two successive

correct trials. The single presentation condition replicated the intentional condition in Experiment 2.

Method

Subjects

Subjects were 68 Carleton University undergraduate volunteers (38 females, 30 males; ages 17-36) recruited for an experiment involving hypnosis and memory. They received course credit for their participation.

Procedure

Experimental session. Subjects were randomly assigned to a list order and to the single or multiple presentation conditions. The word list and orders were the same as those used in Experiment 2 (see Appendix E).

All subjects were administered the hypnotic induction procedure used in the first two experiments (see Appendix B). As in Experiment 2, all instructions and suggestions were tape-recorded. Following the hypnotic induction procedure, all subjects were administered free-recall instructions (see Appendix G), and those in the multiple presentation condition were informed of the learning criterion.

The words were presented one at a time on a memory drum at a rate of 3 sec per word. Subjects pronounced each word as it appeared in the window of the memory drum. Following each presentation, they recalled orally, and the experimenter recorded their recall. They were allowed one

minute to recall the words. In the multiple condition, the list was presented repeatedly until subjects correctly recalled all of the words on two successive trials.

After a single presentation or upon reaching criterion, subjects were administered the amnesia and waking suggestions used in Experiment 2. Again, they had one minute to recall the words, the suggestion was then cancelled, and they were given one further minute for recall. (See Appendix F.)

Amnesia and disorganization were assessed as in the first two experiments.

Susceptibility testing. Subjects were administered a tape-recorded version of the CURSS in small groups of 5 to 10.

Results

Susceptibility

A 2 (Single/Multiple Presentation Condition) x 2 (Partial/No Amnesia) ANOVA on CURSS scores yielded a significant main effect for Amnesia and a significant Condition x Amnesia interaction (see Table 38). Partial amnesics ($M = 3.38$, $sd = 1.83$, $n = 21$) scored significantly higher on susceptibility than nonamnesics ($M = 2.46$, $sd = 1.41$, $n = 46$). The means for the two-way interaction are presented in Table 39. Scheffé post hoc comparisons indicated that partial amnesics and nonamnesics within the single presentation condition did not differ significantly

TABLE 38

Summary Table for Condition x Amnesia ANOVA on Susceptibility

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	1.781	<1
Amnesia (B)	1	13.062	5.62*
A x B	1	9.918	4.27*
Within Groups	63	2.324	

* $p < .05$

TABLE 39

Mean Susceptibility Scores for Condition x Amnesia Interaction

Amnesia	Condition					
	Single			Multiple		
	<u>M</u>	<u>sd</u>	<u>N</u>	<u>M</u>	<u>sd</u>	<u>N</u>
Partial	2.818 _a	1.168	11	4.000 _b	2.261	10
No	2.696 _a	1.663	23	2.217 _a	1.085	23

Note. Means sharing the same letter subscript fail to differ significantly.

on susceptibility. Within the multiple presentation condition, partial amnesics scored significantly higher on susceptibility than nonamnesics.

Amnesia

On the recall trial before the suggestion all subjects in the multiple presentation condition recalled all twelve words, while the recall of subjects in the single presentation condition was more variable. Thus, subjects in the multiple presentation condition could potentially show more amnesia than subjects in the single presentation condition. To remove the possibility of such a bias in amnesia scores, each subject received a score representing the proportion of actual amnesia out of the amount of amnesia possible. The amnesia score was divided by the number of items recalled on the recall trials before the suggestion and after it was cancelled. A one-way ANOVA on the arc-sine transformed proportions revealed no significant difference in amount of amnesia between the single ($\bar{M} = 1.00$, $sd = .38$, $n = 11$) and multiple presentation conditions ($\bar{M} = 1.04$, $sd = .47$, $n = 10$), $F(1,19) < 1$.

Table 40 shows the number of amnesic and nonamnesic subjects in each condition. A Chi-square test of association indicated no statistically significant relationship between Condition and Amnesia, $\chi^2(1) = 1.048$.

TABLE 40

Frequency of Amnesia by Experimental Condition

Amnesia	Single	Multiple
No	23	23
Partial	11	10
Total	0	1

Recall in the Single Presentation Condition

A 2 (Partial/No Amnesia) x 3 (Recall Trial) split-plot ANOVA on recall scores was conducted to determine the presence or absence of differences in original learning. The main effect for Recall Trial and the interaction of Amnesia and Recall Trial were statistically significant (see Table 41). Newman-Keuls post hoc comparisons indicated that mean recall on the trial before the suggestion ($M = 7.88$, $sd = 1.84$) was significantly larger than mean recall during the suggestion ($M = 6.56$, $sd = 2.18$) and after it was cancelled ($M = 6.92$, $sd = 2.07$). The latter two means did not differ significantly.

The means for the Amnesia x Recall Trial interaction are presented in Table 42. Scheffé post hoc comparisons indicated that for the partial amnesics amount recalled during the suggestion was significantly lower than amount recalled before the suggestion or after it was cancelled. The amount recalled before the suggestion and after it was cancelled did not differ significantly. For the nonamnesics, recall decreased continuously across recall trials. Mean recall on the trial before the suggestion was significantly higher than during the suggestion or after it was cancelled. The latter two means did not differ significantly. The most important finding was the absence of differences in recall between amnesics and nonamnesics on the trial before the suggestion.

TABLE 41

Summary Table for Amnesia x Recall Trials ANOVA on Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Amnesia (A)	1	.675	<1
Error	32	10.810	
Recall Trials (B)	2	17.892	23.78*
A x B	2	6.950	9.24*
Error	64	.752	

* $p < .001$

TABLE 42

Mean Recall Scores for the Amnesia x Recall Trials Interaction

Recall Trial	Amnesia			
	Partial		No	
	<u>M</u>	<u>sd</u>	<u>M</u>	<u>sd</u>
Before Suggestion	7.909 ¹ _a	1.446	7.870 ¹ _a	2.029
During Suggestion	5.727 ¹ _b	1.489	6.957 ¹ _b	2.364
After Suggestion	7.364 ¹ _a	1.629	6.696 ¹ _b	2.245

Note. Within a row, means sharing the same number superscript fail to differ significantly. Within a column, means sharing the same letter subscript fail to differ significantly. n's = 11 and 22 for partial amnesics and nonamnesics, respectively.

Effect of susceptibility. A 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVA indicated one statistically significant effect, the Recall Trial main effect reported above (see Table 43). There were no significant effects involving susceptibility.

Trials to Criterion in Multiple Presentation Condition

A t -test revealed no significant difference between amnesics ($M = 6.00$) and nonamnesics ($M = 6.13$) on trials to criterion, $t(31) < 1$. Thus, amnesics and nonamnesics in the multiple presentation condition did not differ significantly on degree of original learning.

Rho Scores

Effect of condition and amnesia. (a) Obtained rho scores. A 2 (Single/Multiple Presentation Condition) x 2 (Partial/No Amnesia) x 3 (Recall Trial) split-plot ANOVA on the obtained values of rho yielded a significant main effect for Condition (see Table 44). Overall, the rho scores for subjects in the multiple presentation condition ($M = .70$, $sd = .37$, $n = 99$) were significantly higher than those for subjects in the single presentation condition ($M = .28$, $sd = .52$, $n = 102$).

(b) Absolute values of rho. A repetition of this analysis on the absolute values of rho again yielded a significant main effect for Condition (see Table 45). Mean rho score for the multiple presentation condition ($M = .75$, $sd = .27$, $n = 99$) was significantly larger than mean rho

TABLE 43

Summary Table for Susceptibility x Recall Trials ANOVA on

Recall Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Susceptibility (A)	2	2.760	<1
Error	31	10.978	
Recall Trials (B)	2	15.174	15.96*
A x B	4	.967	1.02
Error	62	.951	

* $p < .001$

TABLE 44

Summary Table for Condition x Amnesia x Recall Trials ANOVA
on Obtained Rho Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	6.952	20.95*
Amnesia (B)	1	.007	<1
A x B	1	.213	<1
Error	63	.332	
Recall Trials (C)	2	.161	1.12
A x C	2	.250	1.74
B x C	2	.095	<1
A x B x C	2	.326	2.28
Error	126	.143	

* $p < .001$

TABLE 45

Summary Table for Condition x Amnesia x Recall Trial ANOVA on
Absolute Values of Rho

Source	df	MS	F
Condition (A)	1	1.830	16.10*
Amnesia (B)	1	.001	<1
A x B	1	.148	1.30
Error	63	.114	
Recall Trials (C)	2	.042	<1
A x C	2	.060	1.11
B x C	2	.072	1.32
A x B x C	2	.045	<1
Error	126	.054	

* $p < .001$

score for the single presentation condition ($\underline{M} = .52$, $\underline{sd} = .27$, $\underline{n} = 102$).

A further analysis was conducted after eliminating relatively low rho scores. Since subjects in the multiple presentation condition were generally organizing at a high level resulting in a relatively high median for rho on the recall trial before the suggestion ($\underline{Md} = .78$), it was decided to adopt the median from Experiment 2 as a criterion for eliminating subjects. Thus, a further Condition x Amnesia x Recall Trial split-plot ANOVA was performed on subjects with rho scores at or above .4 on the recall trial before the suggestion. The main effects for Condition and Recall Trial were statistically significant (see Table 46). Again, subjects in the multiple presentation condition obtained higher rho scores than subjects in the single presentation condition. As in the first two experiments, Newman-Keuls post hoc comparisons indicated that the mean rho for the recall trial before the suggestion ($\underline{M} = .80$, $\underline{sd} = .17$) was significantly larger than the means for the recall trials during the suggestion ($\underline{M} = .63$, $\underline{sd} = .31$) and after it was cancelled ($\underline{M} = .69$, $\underline{sd} = .27$). The latter two means did not differ significantly. As in the first two experiments, the Amnesia x Recall Trial interaction failed to approach significance. Thus, the decrease in rho across recall trials was not restricted to amnesic subjects.

TABLE 46

Summary Table for Condition x Amnesia x Recall Trial ANOVA on
 Absolute Values of Rho Using Subjects Who Scored at or
 above the Median on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.963	11.81*
Amnesia (B)	1	.147	1.80
A x B	1	.129	1.58
Error	48	.082	
Recall Trial (C)	2	.262	6.83*
A x C	2	.010	2.60
B x C	2	.027	<1
A x B x C	2	.006	<1
Error	96	.038	

* $p < .01$.

Effect of susceptibility. A 2 (Single/Multiple Presentation Condition) x 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVA on the obtained values of rho yielded two statistically significant effects, the Condition main effect reported earlier and a main effect for Susceptibility (see Table 47). Scheffé post hoc comparisons indicated that low susceptibles ($\bar{M} = .72$, $sd = .38$, $n = 39$) obtained higher rho scores than medium ($\bar{M} = .44$, $sd = .53$, $n = 105$) or high susceptibles ($\bar{M} = .43$, $sd = .48$, $n = 57$). Medium and high susceptibles did not differ significantly. The same analysis conducted on the absolute values of rho again produced two statistically significant effects, the Condition effect reported above and a main effect for Susceptibility (see Table 47). As in the previous analysis, Scheffé post hoc comparisons indicated that low susceptibles ($\bar{M} = .78$, $sd = .21$, $n = 39$) obtained higher rho scores than medium ($\bar{M} = .61$, $sd = .31$, $n = 105$) or high susceptibles ($\bar{M} = .58$, $sd = .29$, $n = 57$). Medium and high susceptibles did not differ significantly.

A Susceptibility x Recall Trial split-plot ANOVA including only subjects who scored at or above .4 on the recall trial before the suggestion resulted in the statistically significant Recall Trial main effect reported above (see Table 48). There was a trend for Susceptibility, $p < .10$; the means being ordered as in the first two analyses: low ($\bar{M} = .78$, $sd = .21$, $n = 39$), medium ($\bar{M} = .70$,

TABLE 47

Summary Table for Condition x Susceptibility x Recall Trial

ANOVA on Obtained Rho Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	5.988	19.36**
Susceptibility (B)	2	1.312	4.24*
A x B	2	.189	<1
Error	61	.309	
Recall Trials (C)	2	.163	1.06
A x C	2	.150	<1
B x C	4	.033	<1
A x B x C	4	.025	<1
Error	122	.153	

* $p < .05$ ** $p < .001$

Summary Table for Condition x Susceptibility x Recall Trial

ANOVA on Absolute Values of Rho Scores

Condition (A)	1	1.647	15.13*
Susceptibility (B)	2	.619	5.69*
A x B	2	.090	<1
Error	61	.109	
Recall Trials (C)	2	.106	1.98
A x C	2	.040	<1
B x C	4	.024	<1
A x B x C	4	.032	<1
Error	122	.054	

* $p < .001$

TABLE 48

Summary Table for Susceptibility x Recall Trial ANOVA
on Rho Scores Using Subjects Who Scored at or above
the Median on the First Trial

*Source	<u>df</u>	<u>MS</u>	<u>F</u>
Susceptibility (A)	2	.289	2.63
Error	49	.110	
Recall Trials (B)	2	.403	10.51*
A x B	4	.080	2.09
Error	98	.038	

* $p < .001$

$\underline{sd} = .27$, $\underline{n} = 78$), and high susceptible ($\underline{M} = .63$, $\underline{sd} = .27$, $\underline{n} = 39$).

Seriation Assessed by ARC

Effect of condition and amnesia. A 2 (Single/Multiple Presentation Condition) x 2 (Partial/No Amnesia) x 3 (Recall Trial) split-plot ANOVA on seriation ARC scores for subjects who obtained ARC scores above chance on the recall trial before the suggestion yielded significant main effects for Condition and Recall Trial (see Table 49). Overall, ARC scores were significantly higher in the multiple presentation condition ($\underline{M} = .439$, $\underline{sd} = .298$, $\underline{n} = 99$), than in the single presentation condition ($\underline{M} = .156$, $\underline{sd} = .197$, $\underline{n} = 87$). Newman-Keuls post hoc comparisons indicated that the mean ARC on the recall trial before the suggestion ($\underline{M} = .378$, $\underline{sd} = .266$) was significantly larger than the means for the recall trials during the suggestion ($\underline{M} = .267$, $\underline{sd} = .300$) and after it was cancelled ($\underline{M} = .275$, $\underline{sd} = .300$).

Effect of susceptibility. A 2 (Single/Multiple Presentation Condition) x 3 (High/Medium/Low Susceptible) x 3 (Recall Trial) split-plot ANOVA yielded statistically significant main effects for Condition, Susceptibility, and Recall Trial (see Table 50). The Condition and Recall Trial main effects are the same as those reported above. Scheffé post hoc comparisons of the means involved in the Susceptibility main effect indicated that, overall, low susceptibles ($\underline{M} = .434$, $\underline{sd} = .279$, $\underline{n} = 39$) obtained higher

TABLE 49

Summary Table for Condition x Amnesia x Recall Trial ANOVA on
 Seriation ARC Scores Using Subjects Who Scored above
 Chance Levels on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	2.418	19.16*
Amnesia (B)	1	.034	<1
A x B	1	.333	2.64
Error	58	.126	
Recall Trials (C)	2	.264	8.10*
A x C	2	.006	<1
B x C	2	.031	<1
A x B x C	2	.014	<1
Error	116	.033	

* $p < .001$

TABLE 50

Summary Table for Condition x Susceptibility x Recall Trial ANOVA
 on Variation ARC Scores Using Subjects Who Scored above
 Chance Levels on the First Trial

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	3.119	28.99**
Susceptibility (B)	2	.656	6.10*
A x B	2	.271	2.52
Error	56	.108	
Recall Trials (C)	2	.215	6.85*
A x C	2	.016	<1
B x C	4	.055	1.75
A x B x C	4	.037	1.16
Error	112	.031	

* $p < .01$

** $p < .001$

ARC scores than high susceptibles ($M = .201$, $sd = .252$, $n = 51$). Medium susceptibles ($M = .311$, $sd = .298$, $n = 96$) did not differ significantly from either of the other two groups.

Subjective Organization ARC Scores

Effects of condition and amnesia. A Condition x Amnesia x Recall Trial Pair split-plot ANOVA yielded a single significant effect, the main effect for Condition (see Table 51). Collapsing across pairs of trials, the mean for the multiple presentation condition ($M = .425$, $sd = .314$, $n = 66$) was significantly larger than the mean for the single presentation condition ($M = .147$, $sd = .238$, $n = 68$).

Effect of susceptibility. A Condition x Susceptibility x Recall Trial Pair split-plot ANOVA yielded the same significant main effect for Condition that was reported above, a significant main effect for Susceptibility, and a significant Condition x Susceptibility interaction (see Table 52). Scheffé post hoc comparisons of the means involved in the Susceptibility main effect indicated that, collapsing across pairs of recall trials, the mean for low susceptibles ($M = .367$, $sd = .346$, $n = 26$) was significantly larger than the mean for high susceptibles ($M = .167$, $sd = .241$, $n = 38$). The medium susceptibles ($M = .309$, $sd = .326$, $n = 70$) did not differ significantly from either of the other two groups.

TABLE 51

Summary Table for Condition x Amnesia x Recall Trial ANOVA
on Subjective Organization ARC Scores

Source	df	MS	F
Condition (A)	1	1.837	15.76*
Amnesia (B)	1	.171	1.46
A x B	1	.121	1.04
Error	63	.116	
Recall Trials (C)	1	.0006	<1
A x C	1	.014	<1
B x C	1	.043	1.07
A x B x C	1	.002	<1
Error	63	.040	

* $p < .001$

TABLE 52

Summary Table for Condition x Susceptibility x Recall Trial ANOVA on
Subjective Organization ARC Scores

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	2.178	23.46**
Susceptibility (B)	2	.356	3.84*
A x B	2	.747	8.05*
Error	61	.093	
Recall Trials (C)	1	.018	<1
A x C	1	.037	<1
B x C	2	.031	<1
A x B x C	2	.050	1.21
Error	61	.041	

* $p < .05$

** $p < .001$

The means for the Condition x Susceptibility interaction are presented in Table 53. Scheffé post hoc comparisons indicated that high, medium, and low susceptibles in the single presentation condition obtained lower ARC scores overall than low and medium susceptibles in the multiple presentation condition. Within the multiple presentation condition, high susceptibles obtained lower ARC scores than low and medium susceptibles. None of the other differences were statistically significant.

Amnesia and Serial Position and Item Type

As in the first two experiments, a one-way ANOVA was conducted on arc-sine transformed scores representing the proportion of amnesia at early, middle, and late serial positions. The effect of serial position was statistically significant, $F(2,40) = 3.70$, $p < .05$. Subjects were more likely to be amnesic for middle items ($M = .1.00$; $sd = .66$) than for early ($M = .50$, $sd = .84$) or late items ($M = .55$, $sd = .61$).

A similar one-way ANOVA on the proportion of amnesia for high and low imagery words yielded no statistically significant effect, $F(1,20) < 1$.

TABLE 53

Mean Subjective Organization ARC Scores for Condition x Susceptibility
Interaction

Susceptibility	Condition					
	Single			Multiple		
	<u>M</u>	<u>sd</u>	<u>N</u>	<u>M</u>	<u>sd</u>	<u>N</u>
Low*	.102 _a	.332	12	.595 _b	.128	14
Medium	.125 _a	.210	36	.504 _b	.315	34
High	.186 _a	.256	20	.145 _a	.229	18

Note.. Means sharing the same letter subscript fail to differ significantly.

Discussion

Again, the results failed to support the disorganization hypothesis. There were significant decreases in rho and ARC seriation during the suggestion compared to before it. These decreases however were unrelated to amnesia or susceptibility and were not followed by increases when the suggestion was cancelled. In addition, subjective organization did not differ significantly across recall trials.

There were consistent effects of learning condition. Subjects in the multiple presentation condition obtained higher scores on rho (obtained and absolute values), ARC seriation, and subjective organization than subjects in the single presentation condition. The two conditions did not differ significantly however on amount of amnesia.

In addition, level of hypnotic susceptibility was significantly related to rho, ARC and subjective organization scores. Low susceptibles received higher obtained and absolute rho scores and ARC scores than medium and high susceptibles. There was also a trend in this direction for absolute rho scores when subjects with rho scores below .4 on the recall trial before the suggestion were eliminated from the analysis. Under both the single and multiple presentation conditions, the situation for subjective organization was more complex. In the single presentation condition susceptibility level and subjective

organization scores were unrelated. In the multiple presentation condition however the high susceptibles obtained lower subjective organization scores than medium and low susceptibles. In fact, the high susceptibles in the multiple presentation condition obtained the same low scores as high, medium, and low susceptible subjects in the single presentation condition.

The analysis involving the relationship between susceptibility and amnesia was particularly interesting. As in Experiment 2, amnesic and nonamnesic subjects in the single presentation condition did not differ in susceptibility. In the multiple presentation condition, however, amnesics obtained higher susceptibility scores than nonamnesics. These conditions obviously differed in terms of degree of original learning and, it is more likely that temporary memory lapses unrelated to amnesia would occur given a single presentation than in the multiple presentation condition. The contamination of amnesia scores with temporary memory lapses in the single presentation condition may have effectively eliminated the expected relationship between susceptibility and amnesia.

The analysis of serial position again found selectivity of amnesia for certain serial positions. Amnesia was more likely for middle items than for early or late items. As in Experiment 2, there was no difference in subjects' tendency to show amnesia for high and low imagery words. The serial

position results must be interpreted with caution given the results of Experiment 2. They will be discussed more thoroughly in the general overview to follow.

To summarize, multiple presentations increased the amount of recall organization relative to a single presentation. Nonetheless, this increased organization did not lead to a disorganization effect associated with amnesia.

Overview

The results of all three experiments fail to support the disorganization hypothesis. Regardless of learning set, stimulus materials, or number of presentations, partial amnesia was not uniquely associated with a temporary disorganization of recall. Amnesics and nonamnesics showed equivalent decreases in seriation during the amnesia suggestion as compared to before it. There were no statistically significant changes in subjective organization across recall trials.

From a methodological point of view, it is interesting to compare the results for different measures of organization. When the obtained values of ρ were used, the standard deviations for the groups receiving a single presentation were relatively large, reflecting a wide spread in scores. There was a statistically significant difference between the incidental and intentional conditions on the obtained values in Experiments 1 and 2. Although the means were close to zero, the means for the incidental groups in both experiments were negative, indicating a tendency to order the items in the reverse of their order of presentation. The means for the intentional groups were again close to zero, but positive, indicating a tendency to order the items in the order of presentation. Thus, subjects with the incidental learning set seemed to be biased to recall in reverse order. Evans and Kihlstrom

considered negative rho scores, regardless of their magnitude, to be indexing disorganized recall. This practice is misleading. It seems more appropriate to consider both positive and negative rhos as reflecting organization; seriation in the case of positive rhos and reversed seriation in the case of negative rhos. It is interesting that an incidental learning set (i.e., the typical set in the susceptibility-scale paradigm) appears to bias subjects towards reverse seriation, while an intentional learning set biases them towards positive seriation.

In both experiments there was an increase in obtained rho values across recall trials. Again, however, the differences were small and the means were close to zero. The mean on the first recall trial was negative indicating a general tendency to order the items in the reverse of their presentation order. On the trials during the suggestion and after it was cancelled, the means were small and positive indicating a change in the direction of the presentation order. Thus, subjects recalling different types of items (i.e., suggestions vs. words) showed a similar pattern of results for obtained rho.

In Experiment 3, the multiple presentation condition was higher on obtained rho than the single presentation condition. The words were presented in the same order on every trial in anticipation that subjects would adopt an

organizational strategy based on presentation order. Under these conditions, neither the obtained nor the absolute rho scores changed significantly across recall trials. In the first two experiments analysis of the absolute rho scores revealed no significant changes across recall trials. Thus, the results for the obtained and absolute rho scores for Experiment 3, where all subjects had an intentional learning set and some learned the items to a stringent criterion, were comparable to those obtained for the absolute values of rho in the first two experiments where learning set varied and the items were not well-learned.

When subjects with low rho scores on the recall trial before the suggestion were eliminated from analyses, a significant decrease in rho on the recall trial during the suggestion compared to the trial before the suggestion was obtained in all three experiments. However, this decrease was not related to amnesia or susceptibility. Moreover, there was no significant increase in organization when the suggestion was cancelled. This effect was reliable, given that it occurred in all three experiments. It was however dependent on selecting out subjects with low baseline levels of seriation.

The same pattern of results emerged when seriation was assessed with ARC. In all three experiments there was a significant decrease in ARC during the suggestion compared to before the suggestion. No significant increases were

observed when the suggestion was cancelled. Again, the disorganization was not associated with amnesia or any particular level of susceptibility.

Several explanations might account for the decrement in organization following the first recall trial. First, it might simply be due to statistical regression. It was obtained only when subjects with low scores on the initial trial were eliminated from the analysis. One could argue however that the median split did not simply select out extreme scorers and that sufficient moderates remained to provide evidence for a real effect.

Alternatively, it could be argued that the decrement represents a tendency for subjects to switch to other organizational strategies when repeatedly tested for recall. In a study that assessed several different organizational strategies across free recall learning trials Pellegrino and Battig (1974) found that the seriation strategy was strongest on the first recall trial. This account suggests, then, that if the baseline trial was eliminated, seriation would be significantly higher on the recall trial during the suggestion compared to after the suggestion was cancelled. This hypothesis could account for the results of the groups receiving a single presentation. Subjects in the multiple presentation condition however had already used the seriation strategy for a number of trials prior to administration of the amnesia suggestion. It is not clear

why they would coincidentally switch to another strategy at that point.

Yet another possibility is that seriation is such an unstable strategy and/or so dependent on the immediate prior presentation of the stimulus list that any intervention will disrupt its use. Thus, the administration of an amnesia suggestion may be sufficient to disrupt seriation in subjects, regardless of susceptibility, amnesia, or degree of original learning. In fact, a second recall trial without an interspersed list presentation may produce such an effect. One could test these hypotheses by comparing a group of subjects administered an amnesia suggestion, a group given a distraction task to perform before repeated testing, and a group simply given another recall test. If seriation is easily disrupted, the suggestion and distraction groups should show equivalent decreases in seriation while the repeated recall group should not change. If seriation is dependent on stimulus presentation before each recall trial, repeated recall should also produce disruption. At any rate, it is clear that the disorganization effect obtained in the present series of experiments was not associated with hypnotic amnesia.

There were no significant changes in subjective organization across recall trials. Since subjective organization builds up gradually over recall trials (Pellegrino & Battig, 1974), it may not have been an

important strategy for the single presentation conditions in these experiments. For the multiple presentation group, however, the absence of significant effects clearly fails to support the disorganization hypothesis. This failure to find disruptions in subjective organization associated with amnesia is consistent with a previous study which also employed a relatively short word list learned to a stringent criterion (Spanos, Radtke, & Shabinsky, 1980).

The three experiments differed in terms of learning conditions and stimulus materials. Within each experiment, learning condition had no effect on amount of amnesia. Learning conditions and stimulus materials did however have an effect on the relationship between amnesia and susceptibility. On the basis of the literature, it was expected that amnesics would score higher on susceptibility than nonamnesics. In Experiment 1 this prediction held up. Nonetheless, in Experiment 2, amnesics and nonamnesics did not differ significantly on susceptibility. The only obvious difference between these two experiments was the stimulus materials; test suggestions in Experiment 1, words in Experiment 2. Yet, correlations between susceptibility and amnesia have been reported when the stimulus materials were words (e.g., Spanos & Bodorik, 1977). The results for Experiment 3 indicated that amnesics scored higher on hypnotic susceptibility than nonamnesics only in the multiple presentation condition. As mentioned previously,

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when words presented for a single trial are the stimulus material the confounding of temporary memory lapses and amnesia may mask the relationship between amnesia scores and susceptibility.

This suggests that test suggestions may be more memorable than words. The recall score data provide some support for this claim. The recall scores for the test suggestions were approximately 1.5 items higher on the baseline and posttest trials than they were for the words.

Susceptibility level was related to recall organization, but only under certain circumstances. In Experiment 1, when susceptibility was assessed during the experiment, low susceptibles obtained higher rho scores than medium and high susceptibles. There were no statistically significant effects involving susceptibility in Experiment 2. These null findings may have occurred because the single stimulus presentation used in that study produced very low initial levels of organization. In Experiment 3, however, low susceptibles received higher obtained and absolute rho, ARC seriation and subjective organization scores than medium and high susceptibles. In all three experiments significant effects involving susceptibility and organization were collapsed across recall trials. Hence, they were not associated with amnesia.

These results support those of Schwartz (1978, Note 3) who found differences in the recall organization of high and low susceptibles in the absence of an amnesia suggestion.

They suggest caution in interpreting the data of Evans and Kihlstrom. Obviously, differences between high and low susceptibles during an amnesia suggestion may bear no relationship to amnesia. In the absence of baseline and posttest measures of recall and organization, such results are simply uninterpretable. Further research is clearly needed to determine why susceptibility differences in recall organization occur and what is responsible for the unstable nature of these differences.

Amnesia was related to serial position in the first and third experiments, but not in the second. The failure to find such an effect in Experiment 2 may have been related to the difficulties in measuring amnesia. As mentioned earlier, the amnesia scores in Experiment 2 may have been confounded with different types of temporary memory lapses. The consistent feature of both Experiments 1 and 3 was that the greatest amnesia was for the middle positions. Similar findings were also reported by Stam et al. (1980). Following multiple presentation of a word list, amnesia was greatest for items in the middle and end of the list. These findings are interesting because they are comparable to what one generally finds with "normal" forgetting of a list. Middle items are less memorable than items at either end (Baddeley, 1976).

Amnesia was also related to item type for the test suggestions, but not for the words. Spanos, Radtke-Bodorik,

and Shabinsky (1980) also found that imagery value of a word was unrelated to amnesia. They also used a relatively short list which might have enhanced the memorability of the low imagery words. Future research might focus on item characteristics that influence their memorability.

In summary, the improvements in the methodology of the susceptibility-scale paradigm incorporated into Experiment 1 did not result in a disorganization effect that was restricted to hypnotic amnesia. There was a disorganization effect but it was observed in all subjects regardless of amnesia or susceptibility. Substituting words as the stimulus materials in Experiment 2 again produced null results with respect to organization and amnesia. Even learning the words to a stringent criterion in Experiment 3 did not produce amnesia-specific disorganization.

The failures to find an amnesia-specific disorganization effect in these studies stand in marked contrast to the amnesia-specific disorganization so consistently found when overlearned categorized words are used as stimuli. What might account for these differences? When words belonging to taxonomic categories are used as stimuli, subjects are aware of the categorical nature of the list and of their reliance on the categories as aids to recall. Thus, the category labels inferred from the list are highly salient. Their use as a means for organizing recall therefore may be relatively resistant to disruption.

We argued earlier that hypnotic amnesia results from inattention. According to this notion, subjects who fail to show amnesia continue attending to the recall task despite the suggestion. Because category labels are salient, these subjects continue to employ them as the basis for organizing their recall. On the other hand, amnesic subjects may be particularly intent on avoiding cues that would easily reinstate recall. Therefore, these subjects maintain attention away from category labels. As a result, they are less likely than usual to use these labels in organizing what little they do recall.

Organizing unrelated items in serial order may be a less salient strategy than the clustering of categorized items. If seriation is a less obvious, and perhaps less attended to, strategy than category clustering, subjects may be less likely to seriate in general following minor procedural variations during recall testing. Thus, even in nonamnesics the administration of an amnesia suggestion and two successive recall trials without an interspersed list presentation may be enough to interfere with seriation. This hypothesis suggests that seriation might become more resistant to disruption if subjects' awareness of its use is increased. This could be done by using the one-is-a-bun mnemonic (Bugelski, Kidd, & Segmen, 1968), questioning subjects about their strategies before administration of the amnesia suggestion or constraining recall to serial order.

Increasing the regnancy of seriation before the suggestion in these ways might lead nonamnesics to employ the strategy during the suggestion period, while, at the same time cueing amnesics to avoid the strategy. In short, amnesia-specific disorganization may only occur when organizational strategies are highly regnant before the amnesia test period:

On the basis of this series of three experiments it can be concluded that amnesia in the susceptibility-scale paradigm is not associated with a selective breakdown in the organization of recall. To date, a reliable, amnesia-specific disorganization effect has been restricted to the word-list paradigm. Future research should delineate the factors within this paradigm that produce the disorganization effect.

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Appendix A

Test Suggestions for Experiment 1

Arm Levitation

Keep your eyes closed and put your left arm straight out in front of you. Concentrate on your arm and listen to me. (Begin timing.)

Imagine that the arm is becoming lighter and lighter, that it's moving up and up. It feels as if it doesn't have any weight at all, and it's moving up and up, more and more. It's as light as a feather, it's weightless and rising in the air. It's lighter and lighter and moving up and up. It doesn't have any weight at all and it's moving up and up, more and more. It's lighter and lighter, moving up and up, more and more, higher and higher. (End 30 seconds)

You can relax your arm now. (If necessary, ask the subject to lower his/her arm.)

Hand Lock

Keep your eyes closed. Clasp your hands together tightly, and interlace the fingers. (If necessary, the experimenter states, "Press your hands together, with palms touching," and assists the subject to interlock the fingers and to bring the palms together.) Put them in your lap. Concentrate on your hands and hold them together as tightly as you can.

(Begin timing) Imagine that your hands are two pieces of steel that are welded together so that it's impossible to

get them apart. They're stuck, they're welded, they're clamped. When I ask you to pull your hands apart they'll be stuck and they won't come apart no matter how hard you try. They're stuck together; they're two pieces of steel welded together. You feel as if your fingers were clamped in a vise. Your hands are hard, solid, rigid! The harder you try to pull them apart the more they will stick together! It's impossible to pull your hands apart! The more you try the more difficult it will become. Try; you can't. (End 45 seconds)

(5-second pause) Try harder; you can't. (10-second pause) You can unclasp your hands now.

Thirst Hallucination

Keep your eyes closed. (Begin timing) Imagine that you've just finished a long, long walk in the hot sun. You've been in the hot sun for hours, and for all that time you haven't had a drink of water. You've never been so thirsty in your life. You feel thirstier and thirstier. Your mouth is parched, your lips are dry, your throat is dry. You have to keep swallowing and swallowing. You need to moisten your lips. (3-second pause) You feel thirstier and thirstier, drier and drier. Thirstier and thirstier, dry and thirsty. You're very, very thirsty! Dry and thirsty! Dry and thirsty! (End 45 seconds) Now, imagine drinking a cool, refreshing glass of water. (5-second pause)

Verbal Inhibition

Keep your eyes closed. (Begin timing) Imagine that the muscles in your throat and jaw are solid, and rigid, as if they're made of steel. They're so solid and so rigid, that you can't speak. Every muscle in your throat and mouth is so tight and so rigid that you can't say your name. The harder you try to say your name the harder it becomes! You can't talk! Your larynx has tightened up; your throat and jaw feel as if they are in a vise. Your throat is clamped so tightly that you can't talk; you can't say your name. The harder you try the harder it will be. It's useless; the words won't come out; you can't speak your name; it's impossible to talk! The harder you try to say your name the harder it will become. Try; you can't. (End 45 seconds)

(5 second pause) Try harder; you can't. (10 second pause) You can say your name now.

Body Immobility

Keep your eyes closed. (Begin timing) Imagine that for years and years you've been sitting in that chair just as you are now. Imagine that you've been sitting in that chair so long that you're stuck to it! It's as if you're part of the chair. Your whole body is heavy, rigid, solid and you weigh a ton. You're so heavy that you can't budge yourself. It's impossible for you to stand up, you're stuck right there! Your body has become part of the chair. When I ask you to stand up you won't be able to do it! You're stuck

tight. The harder you try the tighter you'll be stuck and you won't be able to get up. You're heavy in the chair! Stuck in the chair; you can't stand up. You're so heavy and stuck so tight. You can't stand up; you're stuck. Try; you can't. (End 45 seconds)

(5 second pause) Try harder; you can't. (10 second pause) You can relax (or sit down) now.

Foot Immobilization (Time: 1 minute, 20 seconds)

You are very relaxed and comfortable, with a feeling of heaviness throughout your body. I want you now to think about your left leg and foot. Pay close attention to them. They feel numb and heavy, very heavy. How heavy your left foot feels . . . even as you think about how heavy it is, it grows heavier and heavier. . . . Your left foot is getting heavier heavy heavy Your foot is getting heavier, very heavy, as though it were being pressed against the floor. You might like to find out a little later how heavy your foot is--it seems much too heavy to move--but in spite of being so heavy, maybe you can move it a little, but maybe it is too heavy even for that. . . . Why don't you see how heavy it is. . . . Just try to lift your foot up, just try. (Allow 10 seconds)

(If foot lifts:) That's fine. You see how it was harder to lift than usual because of the relaxed state you are in. Now just allow your leg to relax. Your leg and foot now feel normal again. They are no longer heavy. Just relax . . . relax all over.

(If foot does not lift:) That's fine. . . . Stop trying. . . . just relax. Your leg and foot now feel normal again. They are not heavy any more. Just relax . . . relax all over.

Moving Hands Apart (Time: 1 minute)

Now extend your arms ahead of you, with palms facing each other, hands close together but not touching. Let me show you. (Take hold of hands and position them about two inches apart.)

I want you to imagine a force acting on your hands to push them apart, as though one hand were repelling the other. You are thinking of your hands being forced apart and they begin to move apart . . . separating . . . separating . . . moving apart . . . wider apart . . . more and more away from each other . . . more and more . . .

(Allow ten seconds without further suggestions and note extent of motion.)

(If hands have moved a little:) That's fine. You notice how closely thought and movement are related. I'll take hold of your hands and bring them together so that you can feel how much they have moved apart. (Take subject's hands and move them together fairly slowly.)

(If hands have moved apart:) That's fine. Just put your hands back on the arms of the chair and relax.

Mosquito Hallucination (Time: 55 seconds)

You have been listening to me very carefully, paying close attention. You may not have noticed a mosquito that has been buzzing, singing, as mosquitos do. . . Listen to it now . . . hear its high pitched buzzing as it flies around your right hand. . . . It is landing on your hand . . . perhaps it tickles a little . . . there it flies away again . . . you hear its high buzz.

. . . It's back on your hand tickling . . . it might bite you . . . you don't like this mosquito. . . . You'd like to be rid of it. . . . Go ahead, brush it off . . . get rid of it if it bothers you. . . . (Allow 10 seconds)

It's gone . . . that's a relief . . . you are no longer bothered . . . the mosquito has disappaered. Now relax, relax completely.

Eye Catalepsy (Time: 35 seconds)

You have had your eyes closed for a long time while you have remained relaxed. They are by now tightly closed, tightly shut. . . . If you tried to open them now, they most likely would feel as if your eyelids were glued together . . . tightly glued shut. . . . Perhaps you would soon like to try to open your eyes in spite of their feeling so heavy and so completely . . . so tightly closed. Just try . . . try--to open your eyes. (Allow 10 seconds)

(If eyes open:) All right, close your eyes again. You had a chance to feel how tightly shut they were. Now relax . . . just keep your eyes closed and relax.

(If eyes remain closed:) Now relax . . . stop trying. Your eyes are normal again, but just keep them closed and relax.

Arm Rigidity

Please hold your right arm straight out in front of you at shoulder height. Notice that your arm feels slightly numb and that it is beginning to feel tight. Your arm feels tighter and tighter. It is becoming stiff and tight, stiff and rigid. Imagine that your arm is in a splint so that the elbow will not bend. The splint holds the arm stiff and rigid and keeps it from bending. A tightly splinted arm cannot bend. Your arm feels stiff and rigid, solid and rigid, it feels stiff, rigid, and unable to bend. In fact, your arm feels so stiff and so rigid that it won't bend. Test how stiff and rigid it is. Try to bend your arm. (Leave 10 seconds)

OK, that's fine, your arm no longer feels stiff or rigid. You can once again bend it easily. Just let it relax and replace it in your lap.

Music Hallucination

Please listen very carefully to everything that I tell you. I have brought a record player into the room (no record player) and I am now placing the record Jingle Bells on it. The volume is turned down so that you cannot yet hear the music. However, I will slowly begin to turn the volume up, and as I do you will hear the song Jingle Bells

becoming louder and clearer. You will enjoy listening to the song and it will bring back pleasant memories. In fact, you will enjoy listening to the song so much that you will move your head to keep time to the tune. Ok, I'm beginning to turn up the volume and, by listening carefully you can probably begin to hear the tune. The volume is higher now, keep listening to Jingle Bells and let your head keep time with the tune until I ask you to stop. (Leave 15 seconds)

Ok, that's fine, I've turned the record player off now and the tune has stopped. Just sit quietly for a moment and let yourself relax still more.

Visual Hallucination

Please keep your eyes closed until I ask you to open them. Perhaps you didn't know that we keep a pet kitten here in our lab. It's really a very cute, fluffy little kitten. You were so relaxed a moment ago that you may not have noticed that the kitten quietly crawled into your lap and is now sitting there. In fact, if you concentrate, you can feel it sitting quietly in your lap. In a moment I will ask you to open your eyes, look at the kitten sitting in your lap, and pet it with your hand. It's a very friendly kitten and it likes to be petted. Please open your eyes, look at the kitten, and pet it. Keep looking at the kitten until I ask you to stop. (Leave 15 seconds)

Ok, please close your eyes and relax once again. The kitten is no longer in your lap.

Appendix B

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 of 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 up 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--eleven--twelve--deeper and deeper, always deeper sleep.... Thirteen--fourteen--fifteen. You will always hear me clearly no matter how deeply asleep you may be.... Sixteen--seventeen--deep asleep, fast asleep. Nothing will disturb you. You are going to experience many things that I will tell you to experience.... Eighteen--nineteen--twenty. Deep asleep! You will not

awaken until I tell you to do so. You will wish to sleep and have the experiences I shall presently describe.

You are feeling comfortable, relaxed, thinking of nothing, nothing but what I say, your eyes are closed, comfortably closed, you are 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, and backward into the darkness and as you go backward 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 say, 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 will ask you to do.

I will now administer you a number of test suggestions. Some are easier than others. Please try your best to fully experience as many of these suggestions as you can.

[Following presentation of the test suggestion, you will be asked to write down as many of the test suggestions as you can remember. So as you perform each test suggestion try to remember it as best you can so that you will be able to recall it later.]

Note. Instructions enclosed in square brackets will be administered to subjects in the intentional recall condition only.

Appendix C
Recall Instructions and Amnesia Suggestion
for Experiment 1

In a moment I am going to ask you to open your eyes. Although your eyes will be open, you will remain hypnotized. You will be asked to write something and although hypnotized will have no difficulty in writing. Now please open your eyes but remain hypnotized.

On the table in front of you is a pen and paper. Please write down as many of the test suggestions as you can remember. It is not necessary to describe how you responded to the suggestions. Simply write down briefly all of the test suggestions which you can remember. You will have three minutes in which to do this.

[Three minute pause]

Turn to the next page, close your eyes, and listen carefully to what I am going to tell you next. In a moment I shall begin counting backwards from twenty to one. You will gradually wake up, but for most of the count you will still remain in the state you are now in. By the time I reach "five" you will open your eyes, but you will not be fully aroused. When I get to "one" you will be fully alert, in your normal state of wakefulness. You probably will have the impression that you have slept because you will have

difficulty in remembering all of the suggestions I have given you thus far in the session.

In fact, you will find it to be so much of an effort to recall any of the suggestions that you will have no wish to do so. It will be much easier simply to forget everything until I tell you that you can remember. You will be unable to remember the suggestions until I say to you, "Now you can remember everything!" You will not remember anything until then.

After you open your eyes, you will feel fine. You will have no headache or other aftereffects. I shall now count backwards from twenty, and at "five," not sooner, you will open your eyes but not be fully aroused until I say "one." At "one" you will be awake. Ready, now
20-19-18-17-16-15-14-13-12-11-10 (half-way),
9-8-7-6-5-4-3-2-1.

Now please write down as many of the test suggestions as you can remember. It is not necessary to describe how you responded to the suggestions. Simply write down briefly all of the test suggestions which you can remember. You will have three minutes in which to do this.

[Three minute pause]

Please turn to the next page and listen carefully to my words. Now you can remember everything. Again, write down

as many of the test suggestions as you can remember. You will have three minutes to do this.

[Three minute pause]

Appendix D

Summary Tables for ANOVAs on Rho
Involving Susceptibility
as a Factor

Table 1

Condition x Susceptibility x Recall Trials ANOVA
on Obtained Rho Values
With Susceptibility Determined on the CURSS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	3.151	9.90*
Susceptibility (B)	2	0.121	<1
A x B	2	0.284	<1
Error	79	0.318	
Recall Trials (C)	2	0.475	4.75*
A x C	2	0.270	2.71
B x C	4	0.102	1.02
A x B x C	4	0.199	1.99
Error	158	0.099	

* $p < .05$

Appendix D (Continued)

Table 2

Condition x Susceptibility x Recall Trials ANOVA
on Absolute Rho Values With Susceptibility
Determined on the CURSS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.0172	<1
Susceptibility (B)	2	.0134	<1
A x B	2	.1776	2.00
Error	79	.0888	
Recall Trials (C)	2	.0753	1.69
A x C	2	.0567	1.27
B x C	4	.0130	<1
A x B x C	4	.0218	<1
Error	158	.0447	

Appendix D (Continued)

Table 3

Condition x Susceptibility x Recall Trials ANOVA
 on Obtained Rho Values with Susceptibility
 Assessed During the Experimental Session

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	2.260	7.29*
Susceptibility (B) *	2	0.581	1.87
A x B	2	0.024	<1
Error	79	0.310	
Recall Trials (C)	2	0.415	4.15*
A x C	2	0.188	1.88
B x C	4	0.138	1.38
A x B x C	4	0.140	1.40
Error	158	0.100	

* $p < .05$

Appendix D (Continued)

Table 4

Condition x Susceptibility x Recall Trials ANOVA
on Absolute Rho Values With Susceptibility
Assessed During the Experimental Session

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Condition (A)	1	.032	<1
Susceptibility (B)	2	.019	<1
A x B	2	.209	2.46
Error	79	.085	
Recall Trials (C)	2	.083	1.84
A x C	2	.036	<1
B x C	4	.026	<1
A x B x C	4	.079	1.77
Error	158	.045	

Appendix D (Continued)

Table 5

Amnesia x Susceptibility x Recall Trials ANOVA
 on Obtained Rho Values with Susceptibility
 Determined on the CURSS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Amnesia (A)	1	.085	<1
Susceptibility (B)	2	.102	<1
A x B	2	.133	<1
Error	79	.358	
Recall Trials (C)	2	.461	4.41*
A x C	2	.038	<1
B x C	4	.136	1.30
A x B x C	4	.042	<1
Error	158	.104	

* $p < .05$

Appendix D (Continued)

Table 6

Amnesia x Susceptibility x Recall Trials ANOVA
 on Absolute Rho Values with Susceptibility
 Determined on the CURSS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Amnesia (A)	1	.181	1.99
Susceptibility (B)	2	.018	<1
A x B	2	.003	<1
Error	79	.091	
Recall Trials	2	.094	2.12
A x C	2	.089	2.01
B x C	4	.018	<1
A x B x C	4	.018	<1
Error	158	.044	

Appendix D (Continued)

Table 7

Amnesia x Susceptibility x Recall Trials ANOVA

on Obtained Rho Values with Susceptibility

Assessed During the Experimental Session

Source	df	MS	F
Amnesia (A)	1	.078	<1
Susceptibility (B)	2	.827	2.45
A x B	2	.276	<1
Error	79	.338	
Recall Trials	2	.529	5.13*
A x C	2	.033	<1
B x C	4	.147	1.43
A x B x C	4	.090	<1
Error	158	.103	

* $p < .05$

Appendix D (Continued)

Table 8

Amnesia x Susceptibility x Recall Trial ANOVA
on Absolute Rho Values with Susceptibility
Assessed During the Experimental Session

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Amnesia (A)	1	.210	2.33
Susceptibility (B)	2	.044	<1
A x B	2	.009	<1
Error	79	.090	
Recall Trials (C)	2	.125	2.83
A x C	2	.066	1.51
B x C	4	.025	<1
A x B x C	4	.037	<1
Error	158	.044	

Appendix D (Continued)

Table 9

Susceptibility x Recall Trial ANOVA on Absolute Values
of Rho Using Subjects Scoring at or Above the
Median With Susceptibility Determined on the CURSS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Susceptibility (A)	2	.103	1.29
Error	40	.080	
Recall Trials (B)	2	.574	16.60*
A x B	4	.024	<1
Error	80	.035	

* $p < .001$

Appendix D (Continued)

Equation and Explanation for ARC

$$ARC = \frac{O(ITR2) - E(ITR2)}{M(ITR2) - E(ITR2)}$$

$$M(ITR2) - E(ITR2)$$

where $O(ITR2)$ is the number of bi-directional intertrial repetitions, i.e., the number of pairs of items recalled on Trials t and $t + 1$ in adjacent positions in either of the two possible orders, $E(ITR2)$ is the number of bi-directional intertrial repetitions expected on the basis of chance,

$$\text{i.e., } \frac{2c(c-1)}{hk}$$

where c is the number of common items recalled on both Trials t and $t + 1$, h is the number of items recalled on Trial t , and k is the number of items recalled on Trial $t + 1$,

$M(ITR2)$ is the maximum possible number of bi-directional intertrial repetitions.

The equation and explanation were taken from Sternberg and Tulving (1977). For the assessment of seriation, Trial t was the input order (i.e., presentation order) and Trial $t+1$ was the output order (i.e., recall order; see Mandler & Dean, 1969; Pellegrino & Battig, 1974). A separate ARC seriation score was obtained for each recall trial; before the suggestion, during it, and after it was cancelled.

Appendix E
Word List for Experiments 2 and 3

<u>Word</u>	<u>Img</u>	<u>Con</u>	<u>Cat</u>	<u>Mng</u>	<u>Fam</u>	<u>NoA</u>	<u>Pls</u>
Reason	3.11	3.48	3.33	3.93	6.38	3.98	4.11
Justice	3.27	3.69	4.00	4.60	5.97	4.85	4.90
Method	3.20	3.07	3.73	4.02	6.17	4.10	4.00
Fact	3.18	3.08	3.92	4.63	6.50	3.86	4.20
Neuter	3.21	3.32	3.15	3.34	4.42	2.76	2.90
Part	3.07	3.17	2.97	3.37	6.05	3.13	3.58
Car	6.22	6.35	5.93	5.53	6.80	5.74	5.09
Garden	6.23	5.92	5.55	5.51	6.53	5.00	6.07
Kitten	6.28	5.81	6.53	4.47	6.41	4.83	4.84
Lobster	6.35	5.84	6.10	4.07	6.08	4.21	4.93
Scissors	6.21	5.92	5.81	4.05	6.35	3.14	3.54
Dentist	6.16	6.03	6.18	4.46	6.37	4.28	2.78

Note. Img=Imageability, Con=Concreteness,
 Cat=Categorizability, Mng=Meaningfulness,
 Fam=Familiarity, NoA=Number of Attributes, Pls=Pleasantness.

Appendix F

Imagery Rating Instructions, Recall Instructions, and

Amnesia Suggestion for Experiment 2

Imagery Rating Instructions

In a moment I am going to ask you to open your eyes. Although your eyes will be open, you will remain hypnotized. You will be asked to write and to speak and although hypnotized will have no difficulty in writing or speaking. Now please open your eyes but remain hypnotized.

Please listen carefully to what I have to tell you next. Words differ in their capacity to arouse mental images of things or events. Some words arouse a sensory experience, such as a mental picture or sound, very quickly and easily, whereas other words may do so only with difficulty (i.e., after a long delay) or not at all. The purpose of this experiment is to rate a list of 12 words as to the ease or difficulty with which they arouse mental images. Any word that in your estimation arouses a mental image (i.e., a mental picture, or sound, or other sensory experience) very quickly and easily should be given a high imagery rating (at the upper end of the numerical scale). Any word that arouses a mental image with difficulty or not at all should be given a low imagery rating (at the lower end of the numerical scale). For example, think of the word "buffalo." "Buffalo" would probably arouse an image relatively easily and would be rated as high imagery; the word "relevant"

would probably do so with difficulty and be rated as low imagery. Because words tend to make you think of other words as associates, it is important that your ratings not be based on this and that you judge only the ease with which you get a mental image of an object or event in response to each word.

Your ratings will be made on a 7-point scale, where 1 is the low imagery end of the scale, and 7 is the high imagery end of the scale. Make your rating for each word by circling the appropriate number on the answer sheet corresponding to the item number. The words with very high imagery should be given a rating of 7; words that are very low in imagery should be given a rating of 1. Words that are intermediate in imagery, of course, should be rated appropriately between these two extremes, with a rating of 4 representing what you considered average imagery. You should feel free to use the entire range of ratings from 1 to 7, but don't be concerned about how often you use a particular rating as long as it represents your true judgement. Make your ratings as rapidly as you can, but do not be careless in your ratings, and try to give for each word your best judgement as to how easily it arouses a mental image.

The words will appear one at a time for three seconds in the window of the memory drum which is sitting in front of you. As each word appears, pronounce it out loud and make

your imagery rating. The next word will not appear for another three seconds so you will have ample time in which to make your ratings.

It is extremely important that you circle a number on the appropriate line on the answer sheet to record your ratings for each word. There are 12 lines, one for each word. Be sure that you circle only one number for each word--do not leave any lines with no circled number.

To help you keep straight the meanings of the ratings from 1 through 7, at the top of the answer sheet is a rating scale, which shows that 1 represents low imagery and 7 represents high imagery. [When you finish rating the imagery of each word, I will ask you to write down as many of the words as you can remember, so as you rate each word try to remember it as best as you can so that you will be able to recall it later.] Remember, pronounce each word as it appears and then make your rating.

Note. Instructions in square brackets will be administered to subjects in the intentional recall condition only.

[Words presented and rated]

Imagery Rating Sheet

1	2	3	4	5	6	7
Low						High
Imagery						Imagery

Please circle the correct number for each item below.

1.	1	2	3	4	5	6	7
2.	1	2	3	4	5	6	7
3.	1	2	3	4	5	6	7
4.	1	2	3	4	5	6	7
5.	1	2	3	4	5	6	7
6.	1	2	3	4	5	6	7
7.	1	2	3	4	5	6	7
8.	1	2	3	4	5	6	7
9.	1	2	3	4	5	6	7
10.	1	2	3	4	5	6	7
11.	1	2	3	4	5	6	7
12.	1	2	3	4	5	6	7

Now please write down as many of the words as you can remember. You will have one minute in which to write down all the words which you can remember.

[One minute pause]

Amnesia Suggestion

Please [turn to the next page,] close your eyes, and listen carefully to what I am going to tell you next. In a moment I shall begin counting backwards from twenty to one. You will gradually wake up, but for most of the count you will still remain in the state you are now in. By the time I reach "five" you will open your eyes, but you will not be fully aroused. When I get to "one" you will be fully alert, in your normal state of wakefulness. You probably will have the impression that you have slept because you will have difficulty in remembering all the things I have told you and all the things you did or felt. In particular, you will not be able to remember the words that were presented to you on the memory drum while you were hypnotized. After waking you will have no memory for what the words were. You will not be able to remember them until I say to you, "Now you can remember everything." Then you will be able to remember what the words were. But you will not be able to remember the words until I say to you, "Now you can remember everything." After you open your eyes, you will feel fine.

You will have no headache or other aftereffects. I shall now count backwards from twenty, and at "five," not sooner, you will open your eyes but not be fully aroused until I say "one." At "one" you will be awake. Ready, now
20-19-18-17-16-15-14-13-12-11-10 (half-way),
9-8-7-6-5-4-3-2-1.

Now please [write down] recall as many of the words as you can remember. You will have one minute in which to [write down] recall all the words you can remember.

[One minute pause]

Please [turn to the next page and] listen carefully to my words. Now you can remember everything. Again [write down] recall as many of the words as you can remember. You will have one minute to do this.

[One minute pause]

Note. Instructions in square brackets will be administered only to subjects in Experiment 2.

Appendix G

Free Recall Instructions for Experiment 3

Please listen carefully to what I tell you 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 task I give you, quickly and easily. You will have no difficulty speaking or writing. A short list of words will be presented in the window of the memory drum which is located in front of you. Try to remember as many words as you can. The words will appear one at a time for three seconds. As each word appears, pronounce it out loud. At the end of the list, an asterisk will appear in the window of the memory drum. When you see the asterisk, recall out loud as many of the words as you can in any order you like. I will give you one minute to recall the words. [This procedure will continue until you are able to recall all of the words on two successive trials.] Remember, you can recall the words in any order you like. Although your eyes will be open and you will feel alert, you will remain hypnotized. Now open your eyes but remain hypnotized. Please repeat out loud all the words you can remember when you see the asterisk. Remember to pronounce each word out loud as it appears in the window of the memory drum.

Note. Instructions in parentheses will be administered only to subjects in the multiple presentation condition.

END

0	5	H	0	9	H	8	4
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FIN