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HYPNOTIC TIME DISTORTION
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Gerald A. Casey

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ABSTRACT

HYPNOTIC TIME DISTORTION AND LEARNING

by Gerald A. Casey

The present study was designed to investigate some of the phenomena subsumed under the concept of hypnotic time distortion, as advanced by L. F. Cooper, and to test empirically hypotheses bearing on the validity of the Cooper-Rodgin study in which learning done under conditions of hypnotic time distortion was concluded to be over 400% more effective than waking learning. A major assumption of the research was that "hypnosis" is not required to account for time distortion or the effects of time distortion on learning when the relevant variables are controlled: subject or personality variables, instructional-situational variables, the interpersonal relationship, and motivation to perform well on the criterion tasks.

The general prediction was that the subjective time estimates of hypnotized subjects would not be significantly different from those of similarly treated normal, waking subjects, and that neither group would show enhanced learning in the experimental time distortion condition.

A co-experimenter obtained twenty "deep trance" subjects from a population of volunteer college students through individual hypnotic susceptibility screening. Ten

were given post-hypnotic suggestions for rapid induction and continued deep hypnosis (HYPNOSIS GROUP). Instructions designed to maintain interest and motivation to perform well in the "imagination" segment of the research were given to the other ten subjects (WAKING GROUP).

The subjects, randomly assigned to groups, were seen by the same experimenter in five individual sessions of approximately one hour each. The first two days were devoted to TIME DISTORTION TRAINING patterned after the procedures outlined by Cooper and Erickson. One group was trained while "hypnotized," the other under normal waking conditions. FAMILIARIZATION DAY, the third day, was designed to acquaint the subjects with the learning materials, instructions and procedures. On the last two consecutive days, EXPERIMENTAL LEARNING days, each subject received a waking warm-up list, time distortion list, and waking control list. "Deep hypnosis" was induced prior to the time distortion list for the hypnosis group; the groups received identical time distortion instructions immediately before list administration.

The independent variable was "deep hypnosis"; the dependent variables were time distortion measures, obtained on the second day, and learning measures obtained on the last two days. The conditions under which the time distortion measures were obtained were virtually identical to the experimental list learning conditions.

Both of the general predictions were borne out by the results. None of the six specific hypotheses tested reached statistical significance. While every subject in the study gave distorted time estimates (over-estimation) the responses of "hypnotized" subjects were statistically indistinguishable from those of waking subjects; further, there were no significant differences between learning done under conditions of hypnotic time distortion, waking time distortion, and normal waking control conditions. No significant relationships were found between magnitude of time distortion and time distortion learning.

It was concluded that "time distortion" misrepresents the procedures involved and has little relevance to the general psychological literature pertaining to temporal experience. The "hallucinatory experiences" of subjects were concluded to have little in common with hallucinations and seem to best fit the psychological rubric of imagination or imagery. Several research suggestions were given.

The interpretive clarity given to the concept of "hypnotic time distortion," the predicted failure to validate the earlier learning-enhancement findings, and the support given to the behavioral approach to "hypnosis," were the most important outcomes of the research.

HYPNOTIC TIME DISTORTION AND LEARNING

By

Gerald A. Casey

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DEDICATION

to the memory of my father

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INTRODUCTION

Experimental support for the hypothesis that hypnosis facilitates the learning of new material is scarce and equivocal. Although both Weitzenhoffer (1953) and Uhr (1958) concluded in their reviews that suggestions given under hypnosis can improve acquisition and recall they reported only one investigation in which trance learning was found to be markedly superior to waking learning. In that study, by Cooper and Rodgin (1952), paired-associate learning was concluded to be over 400% more effective in the trance condition than in the waking condition and the difference was attributed not to hypnosis, per se, but to the special time distortion technique used by the subject during trance learning. (See Appendix A for a review of time distortion research.)

In that experiment (Cooper-Rodgin, 1952) the performance of one subject was studied over a series of twenty daily learning sessions, receiving two lists of paired-associate nonsense syllables on each day. One list was learned in the waking condition and one in the trance condition, with conditions assigned in alternate order on successive days. The distinguishing feature of the modified spelling anticipation method used was the introduction of a

five-second "study period" after each presentation of a pair of items. The notion was that during this brief interval the hypnotized subject, utilizing time distortion in his "imaginary world" would subjectively experience a much longer period during which to rehearse and learn, and would consequently require fewer trials to reach criteria, compared to his waking performance. This is essentially what they found. Uhr (1958, p. 126), in his review of the study, commented that "the experimental design appears to have done a fine job of eliminating any extraneous bias . . . the results are . . . striking and overwhelming." Weitzenhoffer (1953) likewise accepted Cooper's results and interpretations as valid, i.e., that the observed increase was due to hypnotically altered cognitive functioning.

Two investigators (Casey and Moore, 1962; Barber and Calverly, 1964a) have further investigated the time distortion phenomenon. The writer (Casey and Moore, 1962) extended the time distortion method to the learning of prose materials. Short passages, equated for length and reading ease, were administered to "good" hypnotic subjects, previously trained in time distortion, under experimental and waking control conditions. The experimental task was to read the passage and then "study" in distorted time for 30 seconds. The number of correct responses to standardized comprehension questions provided the dependent measure of learning performance, and showed a small positive difference

favoring the hypnotic time distortion condition, but the difference was not statistically significant. Another aspect of this pilot study was an extensive, relatively unstructured post-experimental inquiry which focused on the subjective features of "study" and subjects' confidence estimates regarding their answers to the comprehensive questions. All subjects felt that they did better in the time distortion condition and they readily gave qualitative descriptions of superior thought processes to justify their claims. The null objective findings and contradictory subjective reports led to the present experimental study, the purpose of which was to replicate the Cooper-Rodgin study with more adequate controls. (See Appendix B for a discussion of methodological and conceptual issues.)

Prior to the preparation of this report Barber and Calverly (1964a) reported a well controlled study of hypnotic time distortion and learning which merits close attention. Three independent treatment groups were constituted: carefully selected "deep hypnotic subjects," and two groups of subjects who had volunteered for a "learning experiment." A pretest list of 12 nonsense syllables was administered individually to all subjects, with 5 minutes allowed for learning and 2 minutes for recall. Retests on an equivalent form of the learning task were given under the following treatment conditions: Group A--hypnotic induction plus time distortion suggestions; Group B--waking time distortion suggestions; Group C--no suggestions. The

dependent variables were (1) the subject's report with respect to the seeming duration of the 5 minute retest period; (2) pretest and retest learning scores.

They found that hypnosis is not necessary to produce time distortion; Group A and Group B did not differ significantly from each other in subjective reports of time distortion, and both groups differed significantly from Group C, whose estimates were quite close to the objective duration of 5 minutes. With respect to learning Barber and Calverly found the mean retest score of Group A to be significantly smaller than both of the other groups, and Group B and Group C did not differ significantly from each other. They attributed the Group A decrement to the induction procedure used (focus on relaxation and drowsiness) and cited other studies which showed that this decrement can be removed if subjects are given explicit suggestions for improved performance.

A further test of the relationship between time distortion and learning was made by computing Pearsonian correlations separately for Groups A and B between (1) subjects' estimates of the duration of the retest period and (2) retest learning scores minus pretest learning scores. Neither correlation differed significantly from zero. These results, together with the comparisons of means, clearly showed no learning advantage for subjects given direct suggestions that time would slow down, either while hypnotized or awake.

Two critical points need to be made about the Barber-Calverly study. First, the investigation was not a replication; in fact, the study tested only a small part of the Cooper-Rodgin hypothesis. It will be recalled that Cooper and Rodgin based their interpretation of the learning enhancement findings not just on expanded time, but also on what occurs in that time. They hypothesized an alteration of cognitive functioning in which subjects were enabled to think in concrete symbols, much like those occurring in dreams, but not bizarre or unrealistic. They assumed that these imagery experiences, reported to be very real and vivid and to cover long periods of subjective time, would produce enhanced learning effects commensurate with the expanded subjective experience of study and not the objective duration. Thus, Cooper and Rodgin's superior thought processes hypothesis involved suggestions for an increase in the ratio $SD/OD = TD$, and suggestions for vivid imaginary study.

The second concern with the Barber-Calverly study is a methodological one. Recent research by Hilgard (1965, pp. 36-44) was designed to test the effect on suggestibility of the following treatments: waking instructions, imagination instructions, and hypnotic induction. The issue was whether the independent groups design was preferable to using the subject as his own control. In the first session no significant differences in suggestibility were found between the treatment groups in response to standardized

suggestions. In the second session all three groups received hypnotic induction. Again, there were no significant differences between group means. There were, however, significant gains between the two days for both waking and imagination groups, and no gain for the group experiencing hypnosis on both days.

Further studies by Hilgard (1965) established that the effects attributed to hypnotic induction occurred irrespective of treatment order. It was concluded that "the effects are indeed small, and this fact is important; that they exist at all means that for some subjects at least the induction procedures may be very important (p. 43)." Fortunately for the present investigator he chose a design which included the best features of both designs and thus maximized the sensitivity to small differences.

The purpose of this study was to test the superior thought processes hypothesis using a rigorous experimental design which replicated the essential procedural features of the Cooper-Rodgin study. It was hypothesized that the subjective time estimates of both hypnotized and waking subjects would be distorted (overestimation) and that they would not differ significantly from each other. The following specific hypotheses were tested.

1. The time distortion measures (TD) of HYPNOSIS GROUP subjects will not differ significantly in magnitude from those of WAKING GROUPS subjects.

2. Learning (as indexed by the number of trials required to reach the ninth or last successive criterion) will not be significantly different for HYPNOSIS GROUP subjects under hypnotic time distortion conditions and normal waking-control conditions.
3. Learning will not be significantly different for WAKING GROUP subjects under waking time distortion conditions and normal waking-control conditions.
4. Learning rate will not be significantly different for hypnotic time distortion and waking time distortion conditions.
5. The magnitude of TD for HYPNOSIS GROUP subjects will not be significantly related to learning under hypnotic time distortion conditions.
6. The magnitude of TD for WAKING GROUP subjects will not be significantly related to learning under waking time distortion conditions.

METHOD

Subjects

A co-experimenter obtained 20 "deep trance" subjects from a population of volunteer college students through individual screening using standard trance tasks and criteria of susceptibility (closely paralleling the Weitzenhoffer-Hilgard Stanford Hypnotic Susceptibility Scale, 1959). Ten Ss, randomly selected from among the screened subjects, were given post-hypnotic suggestions for rapid induction and continued deep hypnosis (HYPNOSIS GROUP). Instructions designed to maintain interest and motivation to perform well in the "imagination" segment of the research were given to the other ten subjects (WAKING GROUP).

Hypnosis group instructions.

(S still deeply hypnotized)

I'd like you to listen carefully now. You've demonstrated that you're a very good hypnotic subject. After today you will be working with Mr. Casey and you will receive some additional hypnotic training. You will find (firmly spoken) that whenever he counts from one to ten you will enter a deep hypnotic trance--as deep or deeper than you are RIGHT NOW. Do you understand? Fine.

(S awakened.)

Waking group instructions.

(S has been awakened)

Well, this completes the hypnosis part of the research. After today you will see Mr. Casey for an experiment that deals with imagination. If you've enjoyed the time you've spent here, I'm sure you'll also find his study interesting. Although I can't discuss my research with you now or the experiences you've had, if you'd like to get in touch with me when you're through, I'd be happy to talk to you.

Materials

The learning materials were taken from Noble (1961). Nine lists of nine CVC (consonant-vowel-consonant) pairs were constructed: three comparable warm-up lists of high scaled meaningfulness, and six comparable experimental lists of moderately low scaled meaningfulness (see Appendix C). Examples of the experimental list items are DAQ-YEM, JEX-WUG, and FIY-VEJ. All items were printed in large capital letters on 3" x 5" cards. A circular series of three different orders was used for all lists, with an intertrial interval of 30 seconds and a five minute rest between lists. The waking group replicated exactly the conditions of the hypnosis group: treatment order was counter-balanced within groups and across days; lists were counter-balanced for treatments and partially for days (see Appendix E).

Time Distortion Training

A complete description of this phase of the research, the problem of time distortion elicitation, and the results obtained, is reported elsewhere (Casey, 1965). Briefly, on the first of two TRAINING DAYS the goal was to elicit from the subjects reports of rich, vivid imagery by suggesting familiar, minimally structured fantasy activities; for example, "be at a beach" or "visit friends." (These instructions are given in Appendix E. Two tape recorded inquiry examples are provided in Appendix F.) Procedures on the second training day emphasized the importance of maintaining the life-like quality of the imagery as established on the preceding day and subjects were given detailed instructions and practice in the use of three different time distortion learning techniques:

Printing (Condition C1).

Shortly, I am going to ask you to open your eyes by saying OPEN, and you will see a card which I will be holding. On it will be printed two syllables separated by a dash. After you have looked at them I will say CLOSE. This will be the signal for you to close your eyes and FIND YOURSELF seated at a desk in a quiet room. In your special time you will print the pair of syllables over and over on a sheet of blank paper. You won't have to hurry, you'll have

plenty of time. I will signal you to stop printing by saying NOW BLANK. Do you understand? Fine.

Visualizing syllables on a blackboard (Condition C2).

This time we are going to do something a little different. You will look at the card I hold, close your eyes when I signal, and then you will FIND YOURSELF in the front row of a quiet classroom. You will find that the two syllables which were on the card will be printed on the blackboard and you will be able to see them clearly. In this imaginery setting, in your special time, you will be able to study the syllables, concentrating on them and thinking of nothing else. Just watch the blackboard and you'll find that the syllables become clearly impressed upon your memory. You won't have to hurry. I'll let you know when the time is up.

Choice of methods (Condition C3).

This time you will look at the card and close your eyes when I signal. Then, in your special imaginery world and special time you will FIND YOURSELF using SOME method to learn the pair of syllables perfectly. It may be a method that you have already practiced, or it may be some entirely new method. You will find yourself doing whatever works best for you. There will be plenty of time between signals to learn the pair easily.

Subjects had three trials with each set of instructions; in each case S looked at a pair of syllables presented on a printed card, closed his eyes, and "studied" the items in "distorted time" in the prescribed manner for an objective duration (OD) of five seconds. After each of these trials S was asked to describe in detail what had happened and to estimate the subjective or seeming duration (SD) of his imagined experience of studying.

Time Distortion Measures

For each of the three sets of instructions administered on the second training day subjects gave three estimates of subjective duration (SD). In all nine instances the time allowed by E for the imaginary, time distorted study was five seconds (OD), the same duration as that used by Cooper and Rodgin (1952). The three estimates given to the third set of instructions represent the best basis for extrapolating to the time distortion present during list learning since (a) the measures represent the final product of time distortion training, (b) no further training intervenes between time distortion training and list learning, and (c) the instructions are nearly identical to those used for list learning on subsequent days.

SD will be understood, then, to be the time estimation given by the subject when asked to estimate how long he "seemed to have" to "study" a single pair of syllables in

distorted time, using whatever method he wished. TD, which Cooper defined as the ratio SD/OD , will also be reported, where OD is constant at five seconds, is measured by a silent stop watch, and refers to the interval between verbal signals from E to start and terminate their time distorted imaginary experiences.

Learning Procedures

At the beginning of each of two consecutive experimental learning days subjects were told they would learn three lists, two under normal (waking conditions), and one under conditions of time distortion (hypnotic time distortion for the hypnosis group). The warm-up list was always administered first. Immediately preceding the time distortion lists, and following hypnotic induction for the hypnosis group, subjects were given the following instructions.

Time distortion instructions.

The procedure for this list will be identical to that used for learning the last list except that this time when the study period begins you will be able to take full advantage of your special time in your imaginary world using whatever method works best for you. You won't have to hurry. You'll have plenty of time. You will look at the card, close your eyes when I signal, and just FIND YOURSELF somewhere using SOME

to learn the pair of syllables. Keep studying until I signal that the time is up.

A spelling anticipation procedure was used for all lists with attempted anticipations beginning on the second trial. Beginning with the second trial, subjects sat in a state of preparedness with their eyes closed. The experimenter read the stimulus member of a pair and the subject attempted to give the associated response member. At the end of two seconds the experimenter said OPEN and placed in full view the card which he had been holding face down on the table. Two seconds after the subject opened his eyes and looked at the card the experimenter said NOW CLOSE which was the signal for the subject in the waking condition to close his eyes and attempt to memorize the pair for a five second period (OD). In the time distortion condition (hypnotic time distortion for the hypnosis group) the NOW CLOSE signal indicated to the subject that he was to study in distorted time. For the waking control lists the NOW CLOSE signal was understood to be the signal to "study as you normally would without time distortion and imaginary experiences."

RESULTS

A Friedman two-way analysis of variance (Seigel, 1956) was performed between the three SD trial-scores for both hypnosis and waking groups. Since neither test reached statistical significance the midrange SD score was computed for each subject as the best estimate of mean performance over three trials (Dixon and Massey, 1957). Likewise, since $TD = SD/OD$, and OD is a constant of five seconds, the same null relationship between trial scores obtains and midrange TD scores are used in testing the relevant hypotheses.

Table 1 shows the midrange SD and TD scores for each of the twenty subjects. Without a single exception SD estimates exceeded OD, yielding TD ratios uniformly greater than one. Although Cooper nowhere defines the magnitude of time distortion required to be considered conceptually significant, the ratios obtained here are quantitatively comparable to those tabled by Cooper (1959, p. 45), many of them exceeding the ratios he presents.

Insert Table 1 About Here

Findings Related to Hypothesis 1

This hypothesis states that the time distortion measures (TD) of HYPNOSIS GROUP subjects will not differ significantly in magnitude from those of WAKING GROUP subjects. As predicted, the Mann-Whitney U test was non-significant ($U = 46.5$).

Findings Related to Hypotheses II and III

These hypotheses state that subjects within their respective groups will fail to show differential learning for the waking control condition versus the experimental condition. Table 2 shows a small non-significant learning advantage for HYPNOSIS GROUP subjects in the time distortion condition on Day I, but no difference at all on Day II (Walker and Lev, 1953). WAKING GROUP subjects learned somewhat faster under the control conditions than under the waking time distortion condition, but these differences were non-significant for both days.

 Insert Table 2 About Here

Findings Related to Hypothesis IV

Hypothesis IV, which states that there is no significant difference between learning done under conditions of hypnotic time distortion and waking time distortion, was supported as shown by non-significant independent t-tests (Walker and Lev, 1953) on both Day I and Day III. Table 3

shows these results and comparisons between the groups under waking-control conditions.

Insert Table 3 About Here

Figure 1 and 2, which pertain to hypotheses II, III, and IV, present the learning curves for both groups under experimental and control conditions. Inspection shows no marked differences between the various curves, with waking group time distortion learning on Day I being the most deviant.

Insert Figures 1 and 2 About Here

Findings Related to Hypotheses V and VI

These hypotheses state that time distortion (TD) scores for subjects within their respective groups will show no significant relationship to learning scores obtained in the time distortion condition. Kendall rank correlation coefficients (Siegel, 1956) were computed between the midrange TD scores and the mean number of trials to criterion on the two time distortion lists administered to each subject. A correlation of $\tau = -.41$ was obtained for the HYPNOSIS GROUP and a $\tau = .13$ for the waking group. Neither of the correlations was significant.

DISCUSSION

The results of the present study demonstrate that "hypnosis" need not be invoked to explain the phenomenon of time distortion. When the relevant variables are controlled the time distortion responses of "hypnotized" subjects are statistically indistinguishable from those of normal, waking subjects. Further, the results showed no significant differences, as predicted, between learning done under conditions of hypnotic time distortion, waking time distortion, and normal waking control conditions; no significant relationships were found to obtain between magnitude of time distortion (hypnotic or waking) and learning.

The Concept of "Time Distortion"

With regard to the first hypothesis the time distortion responses of hypnosis group subjects and waking group subjects were strikingly similar to those reported by Cooper (1959, p. 45) for "well trained," deeply hypnotized subjects and they were not statistically different from each other. Although the time distortion training instructions used in this study were patterned after Cooper's and the explicit intention was to elicit similar time distortion reports, the amount of training involved was considerably less than that deemed necessary by Cooper (1959, p. 32). He

felt that "by and large, training in time distortion requires from three to twenty hours."

Casey (1965) gives a detailed account of the responses of subjects to the suggestions administered during the training phase of this study and provides additional data which, taken together, show that time distortion responses can be elicited in a matter of minutes providing only that subjects are given instructions containing the following sufficient demands: (1) imagine vividly a real, life-like experience (E specifies specific type of experience) complete with sensations and feelings, as if it is actually happening; and (2) describe, shortly thereafter, in as much detail as possible the proceedings, feelings, and content of the experience. When these conditions were met, and subjects were asked how long the experience "seemed to last" (SD), their replies, without a single exception, exceeded OD.

The significant element here, obvious once pointed out, is that consistent overestimations are elicited because subjects are not asked to estimate the actual or objective duration of the interval during which they imagined but to report "seeming duration." The ostensible profundity of "time distortion," when viewed in this light, reduces to a commonplace observation: most people can, and frequently do, imagine themselves engaged in activities which extend over minutes or hours (SD) but which occur in a brief

interval (OD); e.g., in daydreams, fantasies, nocturnal dreams, hypnagogic states, and hypnopompic states.

This is not to depreciate the importance of studying these conditions; the point being made is that "time distortion" is not even a relevant concept in this context because the deviation of a perceptual judgment or estimate of duration (SD) from the objective duration (OD) of the judged interval is not involved. "Time distortion," as the ratio $SD/OD = TD$, when operationally translated, is not a statement of relationship and SD is not a distorted estimate of OD; it is not any kind of estimate of OD.

Time Distortion and Learning

Although, as we have just shown, "time distortion" misrepresents the procedures or operations involved, it could be argued that "time" is important to the extent that SD is consistent with the imaginary event described; this interpretation would raise questions about the role of life-like imagery, with SD being but one index of reality-tone or vividness. Three related issues seem to be involved here. The first problem concerns the criteria used to assess the relative presence or absence of vivid imagery. Secondly, what are the antecedent conditions which produce imagery? Thirdly, does imagery have objective effects as measured on a learning task?

In terms of the first question, providing an operational definition of vividness, the procedure used by

Cooper was to give suggestions for time distorted, vivid imaginary experiences in an intuitive, uncontrolled fashion until more or less elaborate, concrete, detailed reports were provided by the subject, as judged by the experimenter. When E was thus satisfied by the subject's productions and when S answered affirmatively to the question "did it seem real?" then the subject was said to be "well trained in time distortion."

This investigation differed from the earlier studies in that standardized suggestions were employed which explicitly specified the desirability of "real, life-like experiences." On the first training day when subjects were asked after each imaginary experience (six per subject) whether their experience seemed real 89% of all replies were affirmative (see Appendix E), and 100% of the responses on the second day affirmed the vividness of their imagery.

Comparable figures are not available in Cooper's monograph (1959) because the emphasis there was on the affirmative response as a product signalling the completion of "training"; little attention was given to the widely varying procedures and suggestions antecedent to that product.

The other criterion used by Cooper to assess the reality tone or vividness of the imaginary experiences was the presence of "coincidental happenings" (1959, pp. 65-67). While these occurrences strengthened E's confidence regarding the "realness" of the imagery, in the same manner as an

"appropriate" SD estimate, they were not felt to be a necessary concomitant. An example of a "coincidental happening" in the present study (in response to "printing" instructions) was the report that "I couldn't pick up the pencil. I couldn't reach it. I was in my room at the dorm and didn't feel like getting up to get it." (Further illustrations are given in Appendix G.)

This study would have been strengthened had a rating scale been used to obtain more differentiated subjective judgments concerning the vividness of the imagery. Another alternative would have been to use objective scoring criteria to evaluate typescripts or tape recordings of the imagery reports. As it now stands the writer submits that the high percentages of reports attesting to vivid imagery and the imagination report excerpts provided (Appendices F and G) support the assumption that the subjects in this study had imagery experiences as life-like as those reported by Cooper and his colleagues. If SD reports are used as a criterion there is no question of the comparability of the two studies.

With regard to the second question, this study, unlike the Cooper investigations, carefully controlled the antecedent conditions of time distorted imaginary experiences through standardized suggestions and careful selection of subjects, homogeneous with respect to hypnotizability. Further, the use of an independent control group which received instructions for imagery in distorted time, but

did not receive hypnotic induction suggestions permits the conclusion that hypnosis is not necessary for the elicitation of imagery since the reported frequency of real, life-like imagery was nearly identical for the two groups. This finding is consistent with recent well-controlled studies which incorporated rating scales of imagery vividness (Barber, 1964b; Goldiamond and Malpass, 1961) and which also found that hypnotic induction does not facilitate imagery. Fisher (1962) has suggested an explanation of imagery production which resembles that already suggested by the writer in the context of "time distortion": "subjects learn the intended thoroughness of imagery just as they learn other behavioral consistencies--from reinforcements, approvals, and disappointments in the context of the situation."

Cooper and Erickson seemed to have some appreciation of the significance of these factors, but they failed to make explicit in standardized form their implementing procedures and suggestions, and consequently were unable to separate out the relative contribution of the various antecedent components involved. They felt, for example, that 3 to 20 hours were required to train a "deeply hypnotized" subject to have vivid imaginary experiences in distorted time. Further, they felt that "methods that succeed with one subject may fail with another, and a keen appreciation of, and sensitivity to, the delicate interpersonal relationship involved in hypnosis is of paramount

importance, along with resourcefulness and the willingness to try original and varying approaches" (Cooper and Erickson, 1959, p. 32).

The present results indicate that hypnotic induction procedures are not required for the production of vivid imaginary experiences, that these experiences can be elicited easily and quickly, and that explicit response specification of the vivid imaginary experience desired by E is likely the most significant antecedent condition. (The elicitation problem is considered in more detail in an earlier report--Casey, 1965.)

The final question deals with the alleged objective effects of imagery on learning. This study failed to find any support for this assumption. The results showed that learning done under conditions of imaginary study in distorted time, with or without hypnosis, was not significantly different from learning done under waking control conditions. It cannot be objected that the subjects were not given instructions and practice in the use of imagery in manners most advantageous to learning. "Imaginary printing" instructions nearly identical to those used in the Cooper-Rodgin investigation, and supposedly effective, were employed in this study plus additional suggestions and practice--visualizing syllables on a blackboard and doing "whatever works best for you."

It is possible, but unlikely, that the vivid imagery noted on the learning tasks of the second training day was

not also present during the experimental learning days; the design of this study, its procedures and suggestions were specifically created to facilitate maximum transfer from the training stage to the testing phase. To have obtained additional imagery or time distortion measures on the experimental learning days would have entailed interfering with those standardized procedures and made interpretation of the results less clear.

Implications for Future Research

The remarks on "time distortion" were devoted mainly to delimiting the range of relevance of the concept. It was pointed out that "time distortion" has nothing whatever to do with a relationship, distorted or otherwise, between two temporal measures. If time distortion is to be studied in the context of hypnosis, methods and procedures should incorporate psychophysical methods of estimation or judgment and be coordinated with the general psychological literature of temporal experience (e.g., Wallace and Rabin, 1960). One of the more promising approaches would involve the comparison of time-estimates given under standard conditions and under conditions of hypnotically induced psychopathology (Reyher, in press) or emotional arousal.

The second implication of this study is that the "hallucinatory experiences" involved should be thought of as imagery or imaginary experiences and not as perception in the absence of stimulation. Though subjects said that

their imagery was very real and vivid they showed no other evidence, apart from these statements, that they believed in the "reality" of the images, which is the usual criterion for defining "hallucinations."

Controlled, directed, or modulated imagery may have facilitatory effects on certain kinds of problem solving or learning tasks. It is unlikely, though, that this relationship obtains for rote learning or prose comprehension and it would seem more profitable to look for such a relationship using tasks which require reorganization of information or memory images, viz., in the context of creativity. Lack of effort, suspension of attention, incubation, and the twilight states (hypnagogic and hypnopompic) are frequently mentioned by writers and artists as crucial to the creative process.

The final implication is that imagery is probably more significant as a clinical phenomenon where its importance attaches to other idiographic data and where objective effects are not the concern. Reyher (1963) and others have addressed themselves to this issue.

SUMMARY

The present study was designed to investigate some of the phenomena subsumed under the concept of hypnotic time distortion, as advanced by L. F. Cooper, and to test empirically hypotheses bearing on the validity of the Cooper-Rodgin study in which learning done under conditions of hypnotic time distortion was concluded to be over 400% more effective than waking learning. A major assumption of the present research was that "hypnosis" is not required to account for time distortion or the effects of time distortion on learning when the relevant variables are controlled: subject or personality variables, instructional-situational variables, the interpersonal relationship, and motivation to perform well on the criterion tasks. The general prediction was that the time distortion responses of hypnotized subjects would not be significantly different from those of similarly treated normal, waking subjects, and that neither group would show enhanced learning in the experimental time distortion condition.

A co-experimenter obtained twenty "deep trance" subjects from a population of volunteer college students through individual hypnotic susceptibility screening. Ten were given post-hypnotic suggestions for rapid induction and continued deep hypnosis (HYPNOSIS GROUP). Instructions

designed to maintain interest and motivation to perform well in the "imagination" segment of the research were given to the other ten subjects (WAKING GROUP).

The subjects, randomly assigned to groups, were seen by the same experimenter in five individual sessions of approximately one hour each. The first two days were devoted to TIME DISTORTION TRAINING patterned after the procedures outlined by Cooper and Erickson. One group was trained while "hypnotized," the other under normal waking conditions. FAMILIARIZATION DAY, the third day, was designed to acquaint the subjects with the learning materials, instructions, and procedures. On the last two consecutive days, EXPERIMENTAL LEARNING days, each subject received a waking warm-up list, time distortion list, and waking control list. "Deep hypnosis" was induced prior to the time distortion list for the hypnosis group; the groups received identical time distortion instructions immediately prior to list presentation.

The independent variable was "deep hypnosis"; the dependent variables were time distortion measures, obtained on the second day, and learning measures obtained on the last two days. The conditions under which the time distortion measures were obtained were virtually identical to the experimental list-learning conditions.

Both of the general predictions were borne out by the results. None of the six specific hypotheses tested reached statistical significance. The results showed that

the "time distortion" responses of "hypnotized" subjects are statistically indistinguishable from those of waking subjects; further, there were no significant differences between learning done under conditions of hypnotic time distortion, waking time distortion, and normal waking control conditions. No significant relationships were found between magnitude of time distortion and time distortion learning.

It was concluded that "time distortion" misrepresents the procedures involved and has little relevance to the general psychological literature pertaining to temporal experience. The "imaginary experiences" of subjects were concluded to have little in common with hallucinations and seem best to fit the psychological rubric of imagination or imagery. "Time distorted imaginary experiences," in general, can probably be most meaningfully studied in the clinical-psychotherapy setting.

The interpretive clarity given to the concept of "hypnotic time distortion," the predicted failure to validate the earlier leaning-enhancement findings, and the support given to the behavioral approach to "hypnosis," were the most important outcomes of the research.

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TABLE 1.--Midrange SD estimates (in minutes) and TD ratios (SD/OD for hypnosis group and waking group subjects on the final time distortion training task (OD constant at 5 seconds).

Treatment Groups	Measure	Subjects										
		C	E	A	G	J	B	H	I	D	F	
Hypnosis	SD	10	10	5	2	2	1.5	1.0	.4	.3	.2	
		120	120	60	24	24	18	12	5	4	2	
	TD											
Waking	SD	7	5	5	5	4	3.5	.5	.5	.2	.2	
		84	60	60	60	48	42	6	6	2	2	
	TD											

TABLE 2.--Within-group comparisons of mean number of trials to learning criterion under experimental and control conditions.

Group	Treatment		Mean Difference (W-TD)	SD	t*	Sig.
	Waking Control	Time Distortion				
Hypnosis						
Day I	9.5	9.1	.4	.217	1.85	N.S.
Day II	7.8	7.8	0	.272	----	N.S.
Waking						
Day I	9.6	11.0	-1.4	.945	1.48	N.S.
Day II	8.8	8.9	- .1	.264	.38	N.S.

*Paired t with df equals 9.

TABLE 3.--Between-group comparisons of mean number of trials to learning criterion under experimental and control conditions.

Treatment	Group		SD	t*	Sig.
	Hypnosis	Waking			
Waking Control					
Day I	9.5	9.6	1.29	.13	N.S.
Day II	7.8	8.8	1.48	.68	N.S.
Time Distortion					
Day I	9.1	11.0	1.40	1.36	N.S.
Day II	7.8	8.9	1.38	.80	N.S.

*Independent t with df equals 19.

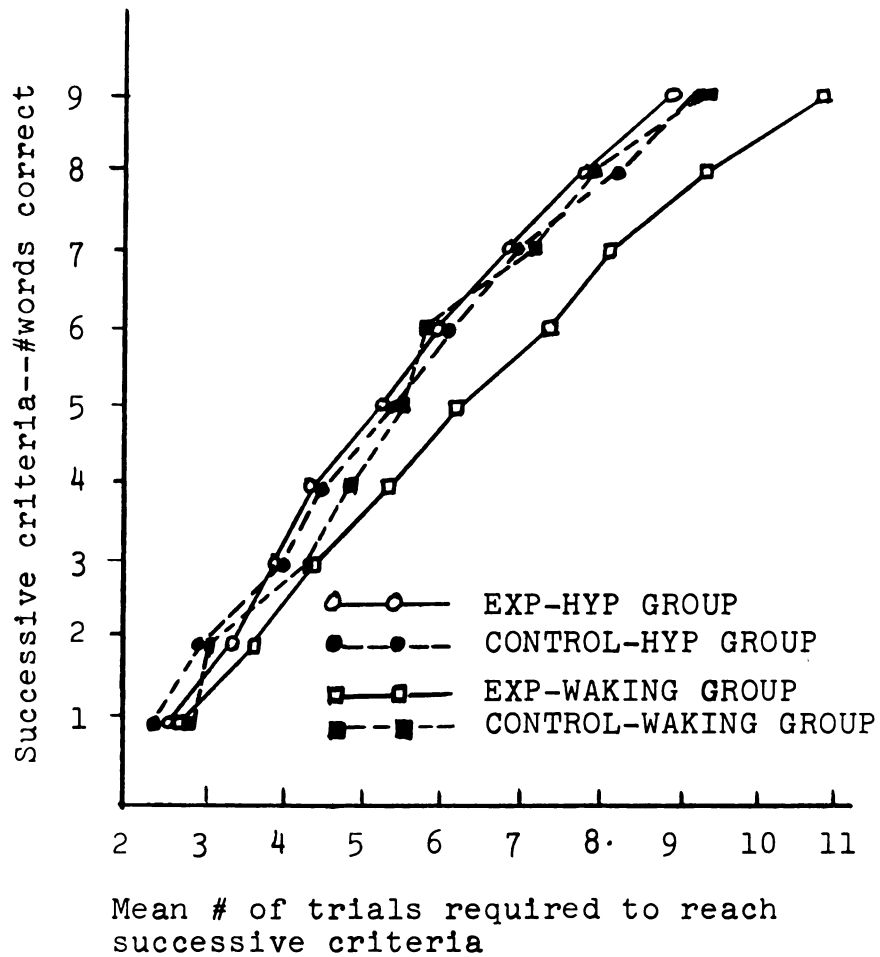


Figure 1.--Learning curves for hypnosis and waking groups on Day I for experimental and control conditions.

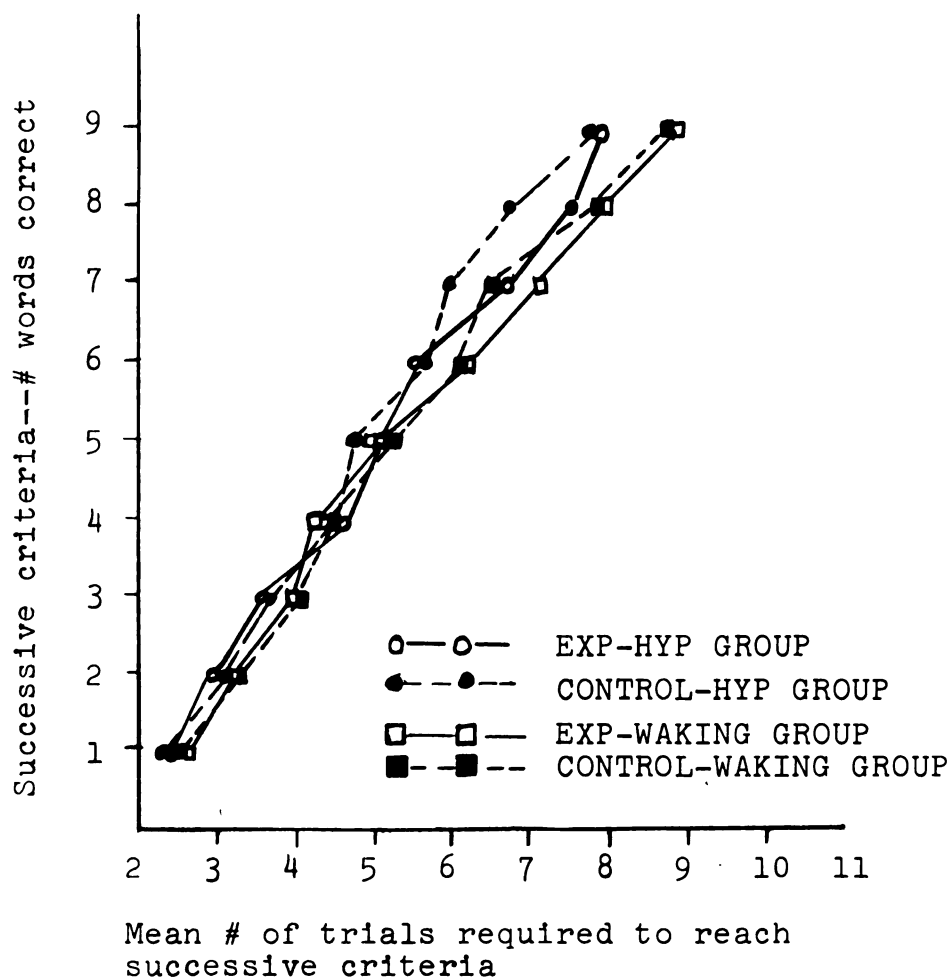


Figure 2.--Learning curves for hypnosis and waking groups on Day II for experimental and control conditions.

APPENDICES

APPENDIX A

REVIEW AND CRITIQUE OF TIME DISTORTION RESEARCH

REVIEW AND CRITIQUE OF TIME DISTORTION

RESEARCH

The concept of "hypnotic time distortion" owes its origin to L. F. Cooper (1948) and refers to the occasion when the subjective or seeming duration of a given interval (SD), as experienced by a hypnotized individual, deviates markedly from the objective duration of that interval (OD). Time may be said to be dilated or expanded when the subject's estimate is larger than the objectively measured duration of the interval, and constricted or condensed when this ratio is less than one. The research efforts and writings of Cooper and his associates at the Georgetown University Medical Center have been concerned almost exclusively with situations in which there is an increase in the time-distortion ratio, that is, when the ratio $SD/OD = TD$ is greater than unity (Cooper et al., 1948, 1950, 1952, 1952a, 1952b, 1959).

Although different methods and procedures have been used the feature common to these investigations (see Cooper and Erickson, 1959) was the implicit or explicit suggestion given to "deeply hypnotized" subjects that imagined experiences, occurring in a brief interval, would seem to last for long periods of time and would seem real and life-like. Given no more than a few seconds subjects testified

to "actually experiencing" events or proceedings extending over minutes or hours. In a typical example a subject demonstrated time distortion by "walking one mile" in what seemed like 13 minutes, with an objective duration of 59 seconds; a second showed extreme time distortion by "watching an entire basketball game" in one second; a third contended that he counted 9,200 BB shots, one by one, within five seconds. The impressive descriptive details and enthusiasm of the subjects concerning their time distorted, imagined experiences led the authors to hypothesize that hypnotic time-distortion facilitates thought processes, mental activity, creative thought, learning, and the recovery of material from the unconscious (Cooper and Erickson, 1959).

Except for the two learning studies which will be reviewed below, Cooper regarded his research as pilot or exploratory in nature. The more important control measures which were omitted, and which were incorporated in this study, were as follows. First, by not using an independent control group of subjects known to be approximately equivalent to experimental subjects with respect to hypnotizability or suggestibility subject differences alone may have accounted for the observed effects; it may have been the case that highly susceptible subjects reported vivid imagery and marked time distortion not because of hypnosis or hypnotic suggestion, but because of a pre-existing proneness to vivid imagery, day dreams, and fantasies (Sutcliffe, 1958; 1961; Aas, 1961; Barber and

Glass, 1962a; Barber, 1964d; Shor et al., 1952). Secondly, failure to use an independent waking control group allowed no means of assessing situational-instructional factors, or the "demand characteristics" of the research (Orne, 1959, 1962; Reyher, in press).

Two experiments were carried out to demonstrate that imagined practice in distorted time would improve learning, as objectively measured, compared to waking learning. In the first experiment (Cooper and Tuthill, 1952a) the task to be learned was writing with the non-dominant hand, with the experimental subjects "practicing" in their "imaginary world" in distorted time. It was reasoned that the vividness of this practice, and its ideo-motor concomitants, coupled with the large number of imagined repetitions possible in a brief objective interval would improve task performance relative to control subjects. Objective measures did not confirm their hypothesis though hypnotic Ss reported task performance to be easier as a consequence of their special practice.

In the second experiment (Cooper and Rodgin, 1952), which is described in the text, the same methodological objections raised in the preceding section apply but several additional points need to be made regarding the Cooper-Rodgin paired-associate study. Failure to control for interpersonal variables is dramatically seen in that the one subject used, and seen for at least twenty separate sessions, was a graduate student in psychology . . .

"cooperative and intelligent and an excellent hypnotic subject" who had had "considerable experience with the experimental use of nonsense syllables." It is difficult to imagine that this particular subject lacked a close, friendly relationship with the experimenter and that he was unaware of the results expected or desired in the study. Control of motivational variables (see Barber and Calverly, 1963d) is, thus, very questionable: the subject may have been highly motivated to (1) perform well on the time distortion lists and/or (2) not perform well on the waking lists.

APPENDIX B

DISCUSSION OF METHODOLOGICAL AND
CONCEPTUAL ISSUES

DISCUSSION OF METHODOLOGICAL AND CONCEPTUAL ISSUES

Though formal definitions of the terms differ widely, "hypnosis," "hypnotized," and "hypnotic trance" tend to be used more or less interchangeably in practice and appear to derive their meaning from a consensual frame of reference:

When it is stated that subjects were "hypnotized" or placed in "hypnotic trance" it is implied that: (1) one of the various types of procedures which workers in this area characterize as "trance inductions" was administered; and (2) the subjects manifested a number of characteristics which by consensus are presumed to signify the presence of "hypnosis" or "trance" (Barber, 1962a).

Methods of "induction" vary widely, from eye fixation and verbal suggestions to drugs, hyperventilation, and compression of the carotid sinus. Nevertheless, considerable agreement exists among researchers regarding the relative effectiveness of these and other techniques; descriptions can be found in most standard hypnosis texts (For example, Dorcus, 1956; Weitzenhoffer, 1957). The characteristics which denote the achieved "hypnotic state," and which presumably are brought about by "induction" procedures, have been summarized by Weitzenhoffer (1957). He defines hypersuggestibility as the cardinal attribute of the "hypnotic state" and says "there seems to be some agreement that hypnotized individuals, even when behaving in a most natural manner, still show a constriction of

awareness, a characteristic literal-mindedness, some psychomotor retardation, and possibly a degree of automatism (p. 31)." Similar indices have been mentioned by Pattie (1956) and Erickson (1961).

Barber (1964c), in a recent, penetrating analysis of the concept of "hypnosis," has argued that (1) using "hypnotic induction" as the criterion for operationally defining hypnosis begs the question since we are ultimately forced to define "induction" by the behavior it produces; (2) using the behavior-signs approach is equally unsatisfactory since experimental evidence indicates that (a) individuals who show passivity, disinclination to talk, literal-mindedness, and a lack of spontaneity may be relatively unresponsive to suggestions (Barber, 1957, 1958a, 1961a, 1962b, 1963a); (b) hypnosis, as inferred from such indices, is not necessary to elicit "high response to suggestions" of body rigidity, hallucination, amnesia, analgesia, deafness, colorblindness, and so on (Barber, 1961b, 1962c, 1962d, 1962e, 1963a, 1963b, 1963c); (c) the "signs" which supposedly denote the hypnotic state can be removed, by explicitly or tacitly suggesting to the subject that he no longer show these characteristics, and many subjects will continue to manifest "high response to suggestions" (Fisher, 1954; Barber, 1958a, 1962b). Barber (1964c) summarizes his argument as follows:

The contention that hypnosis is necessary or sufficient to elicit positive responses to suggestions of body rigidity, hallucination . . . either (a) has not been

demonstrated to be valid (when hypnosis is denoted by such criteria as passivity, disinclination to talk . . .), or (b) is tautological (when hypnosis is denoted by response to suggestions of the type included in the David-Husband, Friedlander-Sarbin, or Weitzenhoffer-Hilgard scales), or (c) tends to be trivial (when the criteria which are used to denote hypnosis are themselves response to suggestions).

The implications of the foregoing theoretical considerations for the present study were clear. "Hypnosis" is not an adequate explanation--in fact is not an explanation at all--for the occurrence of time-distortion, nor is "hypnotic time-distortion" sufficient to account for enhanced learning. What was required was a specification of the antecedent variables which influenced these responses and an assessment of their relative contribution to the total variance observed.

APPENDIX C

LEARNING LISTS AND THEIR SCALED
MEANINGFULNESS VALUES (m')

Experimental Lists and their Scaled Meaningfulness Values (m').

m' Rank Order	Lists					
	1	2	3	4	5	6
1	YIQ - ZUJ .79 .73	XEZ - VUJ .80 .70	KUQ - YIJ .84 .80	XOY - WIJ .70 .85	QAH - XIK .87 .85	YIV - XAZ .84 .73
2	CEJ - QOH 1.00 .85	NEJ - ZOK 1.00 1.00	VUB - GAQ 1.06 .97	CIW - ZAV 1.09 1.07	CUJ - ZEH .90 1.02	XUC - JIH .87 1.02
3	VUF - ZAB 1.09 1.23	GAH - NUQ 1.17 1.13	FOV - KIH 1.17 1.17	VEF - YOQ 1.11 1.09	FAJ - YIG 1.19 1.19	XEC - LUJ 1.17 1.19
4	CUH - MIW 1.33 1.33	HOJ - YIW 1.22 1.21	HAJ - ZID 1.27 1.30	MIV - GOX 1.23 1.23	VAW - YOP 1.17 1.32	WAJ - KUH 1.33 1.20
5	DAQ - YEM 1.39 1.35	BIH - LEQ 1.40 1.38	JEX - WUG 1.39 1.42	FEP - GIC 1.38 1.39	FIY - VEJ 1.37 1.42	ZEG - XIL 1.35 1.33
6	MUB - SIY 1.56 1.56	YAB - PUV 1.52 1.52	WEF - COJ 1.50 1.50	NUH - CAZ 1.58 1.58	RUW - ZAS 1.49 1.50	HEQ - MAF 1.56 1.56
7	BEX - GUD 1.61 1.61	NOF - PIB 1.55 1.55	SEH - ZIN 1.63 1.63	QON - KIY 1.63 1.63	ZUD - TOQ 1.59 1.56	PIF - VEB 1.65 1.66
8	JIR - GOK 1.78 1.82	VOX - SUY 1.77 1.79	JOP - BEZ 1.85 1.74	DOJ - FEC 1.78 1.89	RIX - BAV 1.77 1.74	WOS - RIQ 1.80 1.83
9	TOH - NIV 1.89 1.84	JOH - NEM 1.89 1.89	KEW - RUH 1.87 1.87	FOP - DAH 1.89 1.89	SUV - PEQ 1.85 1.85	QAY - NUK 1.83 1.89
\bar{m}'	1.38 1.37	1.37 1.35	1.39 1.38	1.38 1.40	1.36 1.38	1.38 1.38

Warm-Up Lists and their Scaled Meaningfulness Values (m').

m' Rank Order	Lists					
	1		2		3	
1	RON - SID		HUB - JON		DAL - MES	
	3.32	3.32	3.25	3.25	3.24	3.23
2	DOR - GUM		LAM - BUR		JAR - BUC	
	3.42	3.48	3.34	3.32	3.34	3.33
3	MED - LAT		RIV - TUM		HEM - KIN	
	3.50	3.52	3.45	3.44	3.43	3.46
4	LOW - GET		LIP - MOR		CIV - ROW	
	3.57	3.58	3.50	3.51	3.51	3.51
5	HUG - WAY		PAR - SOB		RUN - WEB	
	3.81	3.79	3.74	3.75	3.74	3.76
6	PAW - BIT		DOL - JIM		BIL - HOT	
	3.90	3.92	3.82	3.79	3.79	3.80
7	JET - FOR		BUM - FAT		DAM - RAT	
	4.01	4.08	3.98	4.00	4.00	3.99
8	PIG - REO		PEN - CAL		TEL - JOY	
	4.14	4.16	4.12	4.15	4.12	4.15
9	GAL - SUN		GOD - TAX		PET - BAG	
	4.20	4.22	4.20	4.19	4.17	4.19
\bar{m}'	3.76	3.78	3.79	3.71	3.79	3.71

APPENDIX D

SCHEMA FOR COUNTERBALANCING LISTS

SCHEMA FOR COUNTERBALANCING LISTS*

Subjects		Familiarization			Experimental					
Experimental Group	Control Group	Day			Days					
		WU	TD	W	WU	TD	W	WU	TD	WU
A	Q	1	1	2	2	3	4	3	5	6
B	R	2	2	1	3	4	3	1	6	5
C	S	3	3	4	1	5	6	2	1	2
D	T	1	4	3	3	6	5	2	2	1
E	U	2	5	6	1	1	2	3	3	4
		WU	TD	W	WU	W	TD	WU	TD	W
F	V	3	6	5	2	2	1	1	4	3
G	W	1	1	2	2	3	4	3	5	6
H	X	2	2	1	3	4	3	1	6	5
I	Y	3	3	4	1	5	6	2	1	2
J	Z	1	4	3	3	6	5	2	2	1

* WU = Warm up TD = Time distortion (plus hypnotic induction for experimental group)
W = Waking

APPENDIX E

TIME DISTORTION TRAINING INSTRUCTIONS--DAY I

TIME DISTORTION TRAINING INSTRUCTIONS--Day I

I'd like you to give me your attention now. For the rest of the time today you're going to have a series of imaginary experiences. Although these will be somewhat like dreams they will be different in that nothing strange, fantastic, or unreal will happen. In fact each experience will be so vivid and life-like that it will seem like it's actually happening. All the sensations, thoughts, feelings, and impressions that you have in real life will be present in the imaginary experiences.

Each time I'll tell you what the experience will be and about how long it will last. Then I'll signal for the experience to start by saying, NOW. You won't have to think or try to imagine anything. Instead, when I say NOW, you'll suddenly and automatically FIND YOURSELF immersed in the experience. You'll just be somewhere, doing something, until it seems that the experience has gone on for about the length of time which was specified. When you reach that point I'd like you to raise your right hand. Then I'll ask you to tell me about it. Do you understand? Fine. Let's try the first one.

The experience to be imagined and the suggested personal time (SPT) were presented in the following standard form: "When I signal by saying NOW, you will FIND YOURSELF

(activity suggestion) for about (or that lasts about) SPT.
NOW."

<u>Condition</u>	<u>Activity Suggestion</u>	<u>SPT</u>
A	<ol style="list-style-type: none"> 1. Somewhere taking a drive 2. At work somewhere doing something 3. At a beach somewhere doing something 	1/2
B	<ol style="list-style-type: none"> 1. Somewhere visiting friends 2. Reliving a pleasant past experience 3. Somewhere playing some kind of game 	15-20 min.

APPENDIX F

TYPESCRIPTS OF TWO TAPE-RECORDED INQUIRIES

TYPESCRIPTS OF TWO TAPE-RECORDED INQUIRIES

SUBJECT G -- HYPNOSIS GROUP

CONDITION A3

SPT = 1/2 Hour

SD = 20 Minutes

OD = .2 Minutes

TD = 100

E: Tell me about it.

S: Well, I was on a beach and it was getting late. Beginning to get dark. It was on a big lake. It must have been one of the Great Lakes or the ocean. You could hear the waves coming in. There was a fire and quite a group of kids. They were all doing the limbo under a rope. By the fire you could see that some of the wood was beginning to get charred. People were dressed up in their bathing suits and cabana outfits. I had a cabana outfit on and one of those khaki colored hats that fold up without getting wrinkles. They're not supposed to anyway. And I was going under the rope and just about didn't make it. It was getting pretty low. And then I went around, went around and waited at the end of the line. People were laughing. Some people were roasting marshmallows. I could recognize some of the people. They were classmates. Some of the people, I didn't know who they were. Didn't know at all. (pause)

E: Uh-huh. How long did this experience seem to last?

S: About 20 minutes.

E: Why do you say 20 minutes?

S: Ah, because we started to limbo. Just seemed like we'd been (pause) a lot we were thinking and doing. We'd just settled down more or less. All sitting around the fire. Had just started and there were numerous amount of people. Quite a few kids. And the line was down to about 10 people. It hadn't been going too quickly. We were laughing and really enjoying ourselves. And then it seemed that twenty minutes was up.

SUBJECT G -- WAKING GROUP
CONDITION B3

SPT = 15-20 Minutes
SD = 15 Minutes
OD = .1 Minute
TD = 150

E: OK. Tell me about it.

S: I was playing football. It was kind of a chilly afternoon. Not cold. There were seven (pause), six (pause), seven fellows on the other side and we were playing without any equipment. We were playing tackle and playing on a football field that was kept up pretty well. It was a fine school. We had the ball in our possession and were switching positions a lot. I played in the backfield most of the time. At halfback. I remember I was in one play. It was a screen pass off the short right flat. I picked it off and (pause). It was sort of at the last minute, on an option, so I had a little bit of running room. The defense was shifted to their right. I got about 10, maybe 15, about 12 yards past scrimmage and the secondary started coming at me. I bounced off one of the guys and ended up getting 24, 25 yards. I remembered that. When I got tackled it kind of jarred me. I almost lost the ball. I fell on it. I kind of saw flashes. I felt it didn't bother me afterwards and got up and went back to the huddle. They scored a touchdown the next play on a pass to the left end in the corner of the end zone. Then we started to switch ends and we were getting ready to kick off (long pause).

E: Uh, huh. What happened then?

S: Well, I don't know (pause) if we kicked off or not.

E: Why don't you know?

S: Seemed like (pause). Just seemed like I stopped dreaming.

E: Uh, huh. How much time did you seem to have? All together.

S: About 15 minutes.

E: Uh, huh. Have you ever actually had that experience?

S: I haven't had that particular experience. I knew the kids but I couldn't tell you their original names. They were just kids I know. I have played that type of football. And I did play a lot of right halfback. (E: uh, huh) But I can't remember this being anything in particular.

E: Did it seem real to you?

S: Oh ya, very real. I felt kind of unsteady when I was tackled on that 24 yard run. But it didn't last long. I felt bad about not getting in on the next play.

E: You feel all right now.

S: Oh yes. I feel fine now.

E: Good. You just relax now and rest.

APPENDIX G

SELECTED INQUIRY EXCERPTS ILLUSTRATING

"COINCIDENTAL HAPPENINGS"

SELECTED INQUIRY EXCERPTS ILLUSTRATING
"COINCIDENTAL HAPPENINGS"

Subject

G	A2	I was in a plant working on the assembly line. It was an engine plant. Really noisy. The guys across were yelling, trying to talk. Time went slow but it was about a half hour, especially when you're not talking
H	A1	(<u>S</u> described experience in a rather hesitant manner. Concluded as follows). When you said NOW I got in a car I didn't own and started driving. That was kind of confusing.
H	B2	(While <u>S</u> was imagining <u>E</u> noted a deep sigh, jaw movements, and finally a dramatic loss of facial tonus. She then raised her hand to signal completion of the experience). I couldn't think of anything pleasant at all. First I saw my mother's face, father's face, and then my brother's face. Then the faces of all the people I know here at school were blended together. I couldn't think of a single pleasant experience. It wasn't like the other experiences that just happened and seemed so real.
J	B2	(After describing the imaginary experience <u>S</u> added the following). I remember I was having trouble getting one. I started thinking about one that was pleasant but it didn't work out so I switched. That's why it took so long.

<u>Subject</u>	<u>Condition</u>	
X	A3	(While <u>S</u> was imagining E noted lateral eyeball movements, a head jerk at 1' 30" and a wince at 4' 20".) We were at the beach . . . decided to go waterskiing. The water was very rough and I fell. They picked me up and went to the raft. Had tuna fish sandwiches. . . .
X	B3	I played two games of ping pong. Won one . . . I got thirsty and had to stop and get a drink . . . The ball got stuck behind the curtain
Z	B1	We were at the lake for the summer. I went over to see my girl friend, but she wasn't home. So I talked to her mother I thought she'd come home but she didn't.
Z	B3	I was up North. On the dock, playing "hit hands" game. It's a stupid game . . . the boy was mean. I liked him at first but he was a rat.
W	C1	I wrote them twice. Hardly got finished. Wrote this time instead of printing.
I	C1	I couldn't pick up the pencil. I couldn't reach it. I was in my room at the dorm and didn't feel like getting up to get it.
T	C2	On the board was JAB-NEL. It was clear. Filled the board. Very big. It was the same room as the last time.
Z	C3	Printed them three or four times. No more time. Printed HED-NUG. Had a pencil and typing paper. No lines. I didn't hurry because I didn't care.

<u>Subject</u>	<u>Condition</u>	
D	C3	Just printed. Three times. Each letter one at a time. Don't know where I was. It was bright though. Maybe in a study room.

APPENDIX H

SUPPLEMENTARY BIBLIOGRAPHY FOR APPENDICES

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