

## RESPONSIVENESS TO SUGGESTIONS UNDER “HYPNOSIS” AND “WAKING-IMAGINATION” CONDITIONS: A METHODOLOGICAL OBSERVATION

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**Abstract:** Two groups of Ss were selected, on the basis of previous experimental participation, for a study of hypnotic analgesia. One group was highly responsive to suggestions in a waking suggestion condition as well as following a formal hypnotic induction procedure. The other group was unresponsive to suggestions unless given a hypnotic induction, following which they became highly responsive. In the course of the present experiment, it was found that the former group were no longer highly suggestible under waking conditions: their self-reports as to how hypnotized they felt strongly suggested that they had been highly responsive to waking suggestion previously because the experimental conditions had allowed them to spontaneously enter hypnosis. The difference in responsiveness when this was not allowed, as in the present study, was striking, even with only 11 Ss. Methodological implications of this finding are discussed.

Over the past few years a number of articles have appeared (Barber & Calverly, 1962; 1963a; 1963b; 1964a; 1964b; Barber & Hahn, 1962) apparently showing that there are no differences in Ss' responsiveness to suggestions following formal induction of hypnosis in comparison to waking-imagination conditions, where there was no formal induction of hypnosis and Ss were simply asked to imagine that the things suggested were true. For a number of reasons discussed elsewhere (Hilgard & Tart, in press), we felt that these results were misleading. A particular reason was that many of the above

Manuscript submitted July 28, 1965.

<sup>1</sup>This research was carried out at Stanford University. The senior author was under the tenure of a Postdoctoral Research Fellowship from the National Institute of Mental Health, United States Public Health Service.

<sup>2</sup>Support for this study came from Grant No. MH-3859 from the National Institute of Mental Health, Public Health Service, and from the San Mateo County Heart Association.

studies preselected *Ss* who were very high in waking suggestibility for both their hypnosis and imagination groups. Since a traditional attribute of hypnosis is hypersuggestibility, this amounted to picking *Ss* for whom hypnosis would be expected to make little difference, and then "finding" that hypnosis did not increase suggestibility. A replication of one of these studies dealing with hypnotic analgesia (Barber & Hahn, 1962) seemed to be indicated. The study was expanded to test the hypothesis of the importance of *S* selection by using two groups of *Ss* under both waking-imagination and hypnotic conditions, and using the *Ss* as their own controls. Both groups were picked from *Ss* tested in a previous study (Hilgard & Tart, in press). The *Ss* in the first group were known to be high in waking suggestibility as well as in hypnotic suggestibility (designated the HW-HH, high waking-high hypnotic group), thus replicating Barber and Hahn's selection procedure. The second group was of *Ss* known to be low in waking suggestibility, but approximately as high as as the first group in hypnotic suggestibility (the LW-HH group). An important methodological observation was made in the course of the experiment on analgesia, viz. that *Ss* run under waking-imagination conditions apparently would not show high suggestibility unless they spontaneously entered a hypnotic state. This observation and its implications is the focus of this paper, and the data on analgesia *per se* will not be presented.<sup>3</sup>

#### Method

The *Ss* for the HW-HH and LW-HH groups were chosen from a pool of *Ss* who had participated in the earlier experiment (Hilgard & Tart, in press), henceforth referred to as the selection experiment. The *Ss* in the selection experiment had been given slightly modified versions of Form C of the Stanford Hypnotic Susceptibility Scale

<sup>3</sup>Data on hypnotic analgesia shall not be presented, for in replicating Barber and Hahn's procedure, it was discovered that their design was inadequate and led to results that could not be interpreted with confidence. Hence, pending further experiments on analgesia, with an improved design, the present report is limited to some observations regarding the "waking-imagination" and "hypnosis" conditions. The inadequacy of the Barber and Hahn design followed primarily from their equating hypnotic analgesia with the fact that *E* has read analgesia instructions. It is obvious from their published data that many of their apparently hypnotized *Ss* felt considerable pain and discomfort, so that absence of physiological signs of discomfort would not be expected. Although some minor improvements in their design were attempted, preliminary results indicated that a major overhaul of the design would be necessary before definitive results could be reported on the physiological responses within hypnotic analgesia.

(SHSS:C) of Weitzenhoffer and Hilgard (1962) on two days, one in a waking condition with instructions to imagine vividly that the suggestions were true, a second following a formal hypnotic induction. The scale consisted of 10 items although half points were occasionally given for partially successful responses to items. The HW-HH group consisted of six Ss (all males) who scored in the upper quartile of the distribution of suggestibility scores under both conditions: the LW-HH group also scored in the upper quartile under hypnosis conditions, but in the lower quartile under waking-imagination conditions. There were four males and one female in this group.

In participating in the earlier experiment, these Ss had been instructed to use a self-report scale of hypnotic depth. This was a greatly shortened version of one reported elsewhere (Tart, 1963). Whenever he was asked, "State?," the S was to respond *immediately* with a number from zero through three. Zero was to indicate he felt wide awake and normal; one that he was in a borderline state, as in falling asleep at night; two that he felt lightly hypnotized; and three that he felt strongly hypnotized. Sometimes Ss spontaneously made finer distinctions, such as 2½. The S was essentially using a shorthand method of telling *E* whether he felt hypnotized or not and making a rudimentary scaling of the degree to which he felt hypnotized. These state reports were obtained before every suggestibility item in testing, and provide a nearly continuous report of the degree to which the S feels hypnotized or, in other terms, of variations in the depth of the hypnotic state as perceived by S. Material on the relationship of these state reports and behavioral measures of suggestibility is presented fully elsewhere (Hilgard & Tart, in press).

In the present study, each S reported individually to the laboratory for a two-hour session, and each was tested under two conditions, waking-imagination and hypnosis. As S did not know, however, that there was to be a second condition immediately following the first, there was no occasion for any unconscious "holding back," a factor which can affect the results in such comparisons (Scharf & Zamansky, 1963; Zamansky, Scharf, & Brightbill, 1964). Approximately half the Ss had the hypnotic condition first, the other half the waking-imagination.<sup>4</sup> As the data showed no evidence of an order effect, this distinction will not be referred to below.

<sup>4</sup>The fact that the laboratory is known as the Laboratory of Hypnosis Research may suggest that Ss tested in the waking-imagination condition first would expect a subsequent hypnosis condition. While this is possible, it seems quite unlikely for two reasons. First, Ss knew that experiments having nothing to do with

In order to minimize problems of *E* inadvertently biasing *Ss* to perform better in one state than the other (see Orne, 1959; 1962; Rosenthal, 1964; Troffer & Tart, 1964), the crucial suggestions were tape-recorded.

Briefly, the experimental session went as follows: *S* (a) had electrodes for physiological measures attached by an assistant<sup>5</sup> (respiration, skin potential, and finger photoplethysmograph); (b) received instructions; (c) was either given a hypnotic induction (from SHSS:C) or an equivalent amount of time to rest and "exercise his imagination"; (d) given two suggestibility test items (Arm Immobilization and Anosmia to Ammonia); (e) given the analgesia test (hand immersed in ice water for three minutes); and (f) if necessary, dehypnotized. The procedure was then repeated for the other condition. State reports were obtained throughout the experiment, generally between every item and change in procedure. In the waking-imagination condition, if any *S* gave a report of one or higher, he was immediately instructed to awaken fully, in order to prevent inadvertent hypnosis.

### Results

The first step in analysis was to verify that *Ss* continued to show the criterion behavior for which they had been selected, i.e., that the LW-HH group would continue to score poorly on the two suggestibility tests given under waking-imagination conditions, but well under hypnosis conditions, and so forth. Only two suggestibility test items had been included in the experiment as this verification was expected to be a routine matter of little importance.

Table 1 presents the suggestibility test scores by which the *S* groups were picked and the attempted verification within the experiment. The LW-HH group showed a mean of 2.2 items passed in waking-imagination conditions, versus 7.4 under hypnosis conditions ( $p < .005$ ). The HW-HH group passed a mean of 7.6 items under waking-imagination conditions, and 8.3 items following hypnotic induction, a nonsignificant difference. The HW-HH and LW-HH groups did not differ significantly in the number of items passed under hypnosis, but did differ markedly under imagination conditions (means of 7.6 and 2.2 items passed,  $p < .001$ ).

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hypnosis were conducted from time to time as a division of the Department of Psychology. Secondly, the self-report scale was introduced prior to starting the imagination condition with the specific injunction that *Es* did *not* want hypnosis to occur in this experiment, and were using the scale to be sure *S* didn't slip into hypnosis.

<sup>5</sup> We wish to express our gratitude to Janet Melei Cuca who served as technical assistant throughout.

TABLE 1  
Suggestibility Test Scores

Group	Subject	Preselection Experiment (maximum = 10)		Present Experiment (maximum = 2)	
		Imagination Condition	Hypnosis Condition	Imagination Condition	Hypnosis Condition
LW-HH	A	2.5	6.5	0	2.0
	B	4.0	9.5	0	2.0
	C	1.5	6.0	0	1.0
	D	2.5	7.0	0	1.5
	E	0	8.0	.5	1.0
	Means		2.2	7.4	.1
<sup>a</sup> <i>p</i>		< .005		< .005	
HW-HH	F	6.5	6.5	0	1.0
	G	8.0	10.0	0	2.0
	H	10.0	9.5	.5	1.5
	I	7.0	7.0	0	2.0
	J	8.0	7.5	1.5	1.5
	K	6.0	9.5	0	1.0
Means		7.6	8.3	.3	1.5
<sup>a</sup> <i>p</i>		n.s.		< .005	
Between Groups:					
<sup>b</sup> <i>p</i>		< .001	n.s.	n.s.	n.s.

<sup>a</sup> Using *t*-test for correlated samples, one-tailed probabilities.

<sup>b</sup> Using *t*-test for independent groups, one-tailed probabilities.

In attempting to verify the consistency of the group selection, however, an entirely different picture emerged. In the present experiment, as shown in Table 1, both groups scored significantly better in the hypnosis condition, and did not differ from one another, i.e., both groups appear to be LW-HH.

In attempting to understand why Ss who formerly had been highly suggestible under waking-imagination conditions now no longer seemed to be so, the speculation was made that in the present experiment it was impossible for Ss to spontaneously drift into a borderline or hypnotic state, whereas this may have been possible in the selection experiment. In the present study Ss had been specifically told that during waking-imagination conditions the State Scale was being used to be sure they didn't drift off (which constituted an implicit suggestion not to do so), and in two cases where Ss did drift off they were immediately brought back to full wakefulness by rousing them

TABLE 2  
Mean State Scale Scores

Group	Subject	Preselection Experiment (maximum = 3.0)		Present Experiment (maximum = 3.0)	
		Imagination Condition	Hypnosis Condition	Imagination Condition	Hypnosis Condition
LW-HH	A	1.0	2.0	0	2.9
	B	.7	2.1	0	3.0
	C	.1	1.5	0	1.8
	D	0	1.1	0	2.0
	E	0	1.6	0	2.1
<sup>a</sup> <i>p</i>		< .05		< .05	
HW-HH	F	1.2	1.9	0	2.0
	G	2.2	3.0	0	3.0
	H	1.5	3.0	0	2.8
	I	1.1	2.3	0	2.0
	J	.5	1.6	0	2.6
	K	1.5	2.2	0	2.1
<sup>a</sup> <i>p</i>		< .02		< .02	
Between Groups: <sup>b</sup> <i>p</i>		< .01	< .03	n.s.	n.s.

<sup>a</sup> Using sign test, one-tailed probabilities.

<sup>b</sup> Using Mann-Whitney U-test, one-tailed probabilities. Test was conducted on summed state reports, rather than means, to avoid ties.

until they reported a state of zero. This suggested that in order for *S* to respond well to suggestibility tests under waking-imagination conditions, he had to slip into a borderline or hypnotic state. State report data had been collected in the selection experiment, but it had not been scored at the time of the selecting of the LW-HH and HW-HH groups. These data were employed to check the above hypothesis; the results are presented in Table 2.

Because *Ss* were forced to remain wide awake in the present experiment, the difference in average state report between the hypnosis and waking-imagination conditions is statistically significant for both groups ( $p < .05$  for group LW-HH and  $p < .02$  for group HW-HH by the sign test).<sup>6</sup>

In the selection experiment significant differences indicative of

<sup>6</sup> Nonparametric tests were used in analyzing the state report data in order to avoid doubtful assumptions about the normality of underlying distributions in such a small group.

feeling more hypnotized in the hypnotic induction condition, for both the LW-HH and HW-HH groups were also found, *but* the state reports of the HW-HH group generally indicate a borderline or hypnotic condition rather than wakefulness, significantly more so than for the LW-HH group ( $p < .01$ , Mann-Whitney  $U$ -test). Also, consistent with the slightly higher suggestibility scores of the HW-HH group in the selection experiment under hypnotic conditions, the HW-HH reported generally higher state scores under the hypnosis conditions of the selection study ( $p < .03$ , Mann-Whitney  $U$ -test).<sup>7</sup>

#### Discussion

As will be discussed more fully elsewhere,<sup>8</sup> one may argue that  $S$ 's report that he feels hypnotized to some degree is primary data about the presence or absence of hypnosis, if not a criterion of hypnosis. In that case, the results of the present study may be interpreted as follows. Some  $S$ s may show a high degree of responsiveness to suggestibility tests under waking-imagination conditions, perhaps as much responsiveness as shown following a formal induction of hypnosis. But, this seems to be due to the fact that these  $S$ s spontaneously enter a hypnotic or borderline-hypnotic condition during the course of the suggestibility tests. These were the HW-HH  $S$ s. Other  $S$ s cannot spontaneously enter hypnotic or borderline states in the course of suggestibility testing, but when given the special assistance of a formal hypnotic induction will do so, with a corresponding increase in suggestibility. These are the LW-HH  $S$ s.

A common observation of every experienced hypnotist, which needs formal reemphasis, is that the formal induction procedure does *not* necessarily produce a hypnotic or even a borderline state in some  $S$ s. The fact that  $E$  has not administered an induction procedure should not be taken as insuring that the  $S$  is wide awake and in a normal

<sup>7</sup>In order to maximize the reliability of the suggestibility measure and the average state report measure assigned each  $S$ , the data presented above for the selection experiment are based on *all* test items and *all* state reports. If only the two identical test items, Arm Immobilization and Anosmia to Ammonia, are used as the data from the selection experiment, for greater comparability with the present experiment, the same patterning of scores and differences between groups are seen. Judging by the state reports obtained just prior to each of the two test items, *all*  $S$ s in the HW-HH group reported that they felt a borderline or hypnotic state during the imagination condition. A one-page table showing these data has been deposited with the American Documentation Institute. Order Document No. 8893, remitting \$1.25 for 35-mm. microfilm or \$1.25 for 6 by 8 in. photocopies.

<sup>8</sup>Tart, C. T. Unpublished report in preparation.

state. As reported elsewhere (Hilgard & Tart, in press), a state report obtained immediately after an induction procedure or equivalent rest period is more predictive of subsequent suggestibility than the formal conditions of induction or rest. A similar finding holds for predicting hypnotic dream experiences (Tart, in press). Some recognition of these factors is implicit in Orne's (1959) warning that in using simulating Ss to investigate hypnosis, it is essential to interview them afterwards to be certain they did not become inadvertently hypnotized.

The results of the present study, then, graphically illustrate that in comparing behaviors obtained under "hypnotic" and "nonhypnotic" conditions, it may be quite misleading to "operationally" distinguish these conditions on the basis of *E*'s behavior, i.e., whether or not *E* goes through an induction procedure. While approaches other than the use of a self-report state scale may be developed, some method of controlling those for Ss who spontaneously slip into hypnosis, or do not go into hypnosis despite a formal induction procedure, must be employed. Not to do so has the effect of adding considerable error variance which could obscure real differences between the conditions. The fact that this became apparent in the present study using only 11 Ss and a very brief testing procedure suggests that the effect may be very strong indeed.

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**Sobre las Respuestas a las Sugestiones en Hipnosis y en Imaginería  
Vigil. Una Observación Metodológica**

Charles T. Tart y Ernest R. Hilgard

**Resumen:** Dos grupos de sujetos experimentales fueron seleccionados para un estudio en analgesia hipnótica en base a su participación en experimentos previos. Los sujetos de uno de los grupos demostraron ser muy sugestibles tanto a sugestiones en vigilia como a sugestiones después de una inducción de hipnosis. Los miembros del otro grupo demostraron ser refractarios a toda sugestión a menos que existiera una inducción de hipnosis previa. Durante el presente experimento pudo observarse que los miembros del primer grupo dejaron de ser sugestibles en vigilia. Evaluando cuidadosamente las autoobservaciones de estos sujetos se desprende que lo más probable es que en las ocasiones en que habían respondido a las sugestiones en vigilia, en realidad lo hicieron porque habían entrado en estado de hipnosis. Fué sorprendente la diferencia en las respuestas cuando no se les permitió entrar en hipnosis a este pequeño grupo de 11 sujetos. Se discuten las consecuencias metodológicas de estos hallazgos.

**Suggestionsreaktionen in Zuständen der "Hypnose" und "Wacher  
Einbildungskraft": Eine Beobachtung für methodische  
Auswertung**

Charles T. Tart und Ernest Hilgard

**Abstrakt:** Zwei Gruppen von Subjekten wurden auf der Basis früherer Teilnahme an Experimenten für ein Studium hypnotischer Analgesie zusammengestellt. Eine Gruppe reagierte in hohem Masz sowohl auf Sugestionen in wachem Sugestionszustand als auch nachdem eine formale Hypnose eingeleitet worden war. Die andere Gruppe reagierte nur auf Sugestionen, nachdem sie hypnotisiert worden war; dann jedoch

wurde sie sehr reaktionsfähig. Im Verlauf des Experiments fand man, dass die erste Gruppe im wachen Zustand nicht mehr hochemfindlich war: Von ihren eigenen Berichten über ihr Hypnotisierersein entnahm man, dass sie Suggestionen im wachen Zustand zuerst so empfänglich waren, da die Begleitumstände des Experiments es ihnen gestatteten, spontan in Hypnose zu gehen. Der Unterschied in Reaktionsfähigkeit, wenn dies nicht der Fall war—wie in dem gegenwärtigen Studium—war erstaunlich, sogar mit nur elf  $V_{pn}$ . Die Bedeutung dieser Ergebnisse betrifft methodischer Auswertung ist unter Diskussion.