

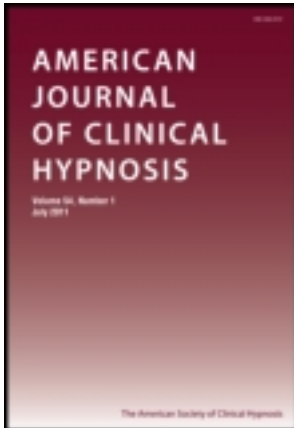
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Alterations in Consciousness in Neutral Hypnosis: Distortions in Semantic Space¹

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30 highly hypnotizable Ss were equally divided into three groups, equated for age, sex and hypnotic susceptibility. A semantic differential scale was administered to each S in waking, individual sessions. An oral form of the same scale was administered during: (a) hypnosis (E), (b) waking—post hypnosis (C1), and (c) waking—no hypnosis (C2). All groups showed significant change between administrations of the scale; E showed more change than C1, and the latter more than C2. Ratings of "My Self" changed toward the negative pole in the evaluative factor. Results were interpreted as indicating a distortion in semantic space and an alteration in ego-state occurring spontaneously with hypnosis.

The concept of hypnosis as an altered state of consciousness, in which S becomes aware of a qualitative change in his self-awareness and his frame of reference, has formed the basis for many theoretical formulations of hypnotic behavior (Bellack, 1935; Orne, 1959; Edmonston, 1967).

White (1941) laid the foundation for contemporary theories when he proposed that hypnosis produces major changes in the organization of behavior, including extensive alterations in the patterns of experience which constitute the self. Shor (1959, 1962) characterized hypnosis as a dissolution of S's "generalized reality-orientation," in which experiences take on different meanings, the normal frame of reference fades, and the hypnotic situation functions as a substitute reality.

However, the concept of hypnosis as an "altered state" has not been universally accepted. Role-theoretical formulations (Sarbin & Andersen, 1967), stimulus-response theories (Edmonston, 1967), and hypnosis as an intervening variable, anchored in antecedent verbal stimuli and consequent behaviors (Edmonston, 1967; Barber, 1969) generally do not conceive of hypnosis as an altered state.

Attempts to evaluate hypnosis as an altered state of consciousness (Sarbin, 1939; Levine, Grassi & Gerson, 1943; Wilkins & Adams, 1947; Brenman, Gill & Hacker, 1947; Schneck & Kline, 1951; Brenman, Gill & Knight, 1952; Arluch & Balinsky, 1953; Webster, 1962; Woolington & Markwell, 1962; West, Baugh & Baugh, 1963; Ludwig & Levine, 1965; and Markwell, 1965) have produced inconsistent results. However, some systematic changes in personality do seem to occur in neutral hypnosis. There is an increase in spontaneity of thought and in the occurrence of novel approaches to stimuli. Many of the personality changes reported seem to have to do

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with *S*'s perceptions of his *self*, his relation to external reality, and to the meanings which he imposes on his experience.

To define hypnosis as a state of the organism characterized by an alteration in *S*'s normal frame of reference (unusual perceptions of self and environment) and by the statistical improbability of certain events, given normal conditions, would not be out of keeping with the literature or prevalent induction procedures. In hypnosis, perceptual content is reduced, input and output of neural excitation is inhibited, and the frame of reference is narrowly restricted: the attention of *S* is focused only on one aspect of reality, so that the remainder fades into the background and becomes nonfunctional. Hypnotic behavior seems to operate apart from the totality of *S*'s experiences and should, therefore, lead to spontaneous changes in the meanings assigned to specific and general concepts.

METHOD

Subjects

Ss were 30 male and female volunteers from the student population at Colgate University and local townspeople. All *Ss* achieved a score of 10 or higher on the Harvard Group Scale of Hypnotic Susceptibility (HGSHS, Shor & Orne, 1962) or an equivalent range on the Barber Suggestibility Scale (BSS; Barber, 1969). The *Ss* were divided into three groups equated for age, sex, and susceptibility scores.

Apparatus

A form of the Osgood Semantic Differential (Osgood, Suci, & Tannenbaum, 1957) was devised especially for this experiment. All inductions, standard instructions to relax and exclude peripheral stimulation, based on the Stanford Hypnotic Susceptibility Scale (SHSS, Weitzenhoffer & Hilgard, 1959), were administered personally by one *E* (JFK).

Procedure

Either the HGSHS or BSS was administered to all *Ss* prior to the experimental session. Each *S* individually received one, one-half hour "training" session with the SHSS-derived induction, fractionation procedures and a rapid induction signal to facilitate induction of hypnosis during the later experimental session. Criteria for adequate training were: (a) positive response to a suggestion for speech-inhibition; and (b) a subjective rating of trance-depth of at least 80 on a 100 scale.

Ss were then assigned to their respective groups. Group E received hypnotic induction and responded to personality-test stimuli during a neutral trance (no further suggestions after induction). Group C1 received hypnotic induction and responded to test stimuli after the hypnosis had been terminated. *Ss* in Group C2 were engaged in conversation by JFK for a period of time equal in length to the hypnotic inductions received by the other two groups between test administrations.

During each experimental session the Semantic Differential Scale was administered under each of two conditions: (a) Pre-I condition, before induction of hypnosis or control condition; and (b) Post-I condition, after induction of the hypnosis, termination of hypnosis, or conversation. The Pre-I administration was the standard paper-and-pencil form; the Post-I form of the test was a tape-recorded version (JFK), so that *Ss* in Group E could keep their eyes closed during trance.

At the close of each experimental session *S* was queried as to knowledge of the nature of the experiment and cautioned not to discuss it with others.

RESULTS

Appropriate, 7-point adjective scales of the Semantic Differential were summed together to yield scores for the Evaluative (E

—Good-Bad, Optimistic-Pessimistic, Complete-Incomplete, Timely-Untimely), Potency (P—Strong-Weak, Hard-Soft, Severe-Lenient), and Oriented Activity (A—Active-Passive, Hot-Cold, Excitable-Calm) factors. Scale scores ranged from 1 (Good, Strong, Active) to 7 (Bad, Weak, Passive) with unit steps inbetween.

These factors served as coordinates to define a point for each concept in a three-dimensional "semantic space" for each *S*. The differences (*D*) between coordinates of Pre-I and Post-I administrations of the Semantic Differential Scale were calculated according to:

$$D = \sqrt{d_1^2 + d_2^2 + d_3^2}$$

D-scores were computed for each concept, for each *S*. Also, mean *D*-scores were computed for each concept within each group (*D_c*); and for each *S* within each group (*D_s*).

Comparison of the overall mean *D*-scores (*D_t*) by *t*-tests for related measures showed that the responses for each group changed significantly from Pre-I to Post-I administrations of the test form (Table 1).

The *D_s*-scores were averaged over each group. Analysis of variance (randomized design) of these mean scores showed significant treatment effects among the three groups of *S*s (*F* = 5.079; *p* < .01). Comparisons of mean *D*-scores by *t*-tests (independent groups) demonstrated that each group mean was significantly different from the other two (Table 2). A higher degree of change was observed in Group E than in

TABLE 1
SIGNIFICANCE OF *D_t*-SCORES WITHIN GROUPS*

Group	Mean D	s.d.	df	<i>t</i>
E	4.275	2.828	99	15.11**
C1	3.213	1.929	99	16.65**
C2	2.497	1.490	99	16.75**

* Nondirectional *t*-tests
** *p* < .001

TABLE 2
SIGNIFICANCE OF *D_c*-SCORES AMONG GROUPS*

Group	Mean D	s.d.	df	<i>t</i> Compared with	
				C1	C2
E	4.275	2.828	18	3.101**	5.621***
C1	3.213	1.929	18		3.024***
C2	2.497	1.490			

* Nondirectional *t*-tests
** *p* < .01
*** *p* < .001

Group C1; and more change appeared in Group C1 than in C2 (Tables 1 and 2).

Analysis of variance (treatments-by-subjects design) of the *D_c*-scores for each concept across all three groups showed a trend toward a differential effect on change, according to the concept being considered (*F* = 1.338; *p* < .20). Mean *D_c*-scores, analyzed by *t*-tests (Table 3), showed that only four concepts reflected significant changes among groups: "My Self," "Love," and "Hate" showed significantly greater change in Group E than in Group C2; "Hate" and "Sex" gave more change in Group C1 than in C2. No differences between Group E and Group C1 were noted.

Wilcoxon sign-tests for each factor within the concepts "My Self," "My Ideal Self," "My Body," "My Mind," "Mother," and "Father" demonstrated significant positive ("bad") changes (*p* < .05) in the evaluative factor of "My Self" and "My Body" for Group E, and in the potency factor of "Mother" in Group C2. No other groups reflected change in these concepts. No other concepts, for any group or any factor, showed any significant directional change.

DISCUSSION

The results confirm the major hypothesis, that neutral hypnosis does produce alterations in the meanings assigned to certain concepts. The differences between Pre-I and Post-I administrations in the C2 (nonhyp-

TABLE 3
MEANS AND STANDARD DEVIATIONS OF D₀-SCORES FOR EACH CONCEPT

Group Concept	E		C1		C2	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
My Self	3.618 ^a	2.056	2.858	1.709	1.911 ^a	0.704
My Ideal Self	4.278	2.719	3.578	2.235	2.828	2.160
My Body	5.243	3.637	2.967	1.101	2.777	1.244
My Mind	3.720	2.405	2.903	1.442	2.490	1.501
Mother	4.086	2.788	2.419	1.602	3.431	2.225
Father	3.535	2.427	2.368	0.937	2.365	1.156
Love	4.656 ^a	2.407	3.402	2.871	2.296 ^a	1.983
Hate	5.601 ^b	3.165	4.391 ^a	1.919	2.197 ^{ab}	1.517
Sex	3.178	2.477	4.465 ^b	2.463	1.955 ^b	1.143
School	4.827	3.930	2.783	1.672	2.470	4.827

Note: Superscripts pertain to differences between groups on given concepts. ^a $p < .05$; ^b $p < .01$.

notized) group may be accounted for by the difference between responding to a paper-and-pencil and an oral form of the same scale. Given the brief interval between administrations, it is unlikely that events occurred that would significantly alter the meanings assigned to the concepts. This argument may be extended to a portion, but not all, of the differences within the two groups of hypnotized Ss, E and C1.

Differences between the hypnotized and nonhypnotized groups in other studies have been explained in terms of Ss' perceptions of the intent of the experiment and the hypothesis of Es (Orne, 1962; Markwell, 1965; Ludwig & Levine, 1965; Rosenhan, 1967; Orne & Holland, 1968). The present design controlled for this possibility, in that Ss in both groups E and C1 viewed themselves as members of a group receiving experimental treatment, rather than as "controls." Thus, if Ss were responding in such a way as to "help" the Es, the amount of change in Post-I testing would have been the same, and the mean D-scores (Groups E and C1) would not have differed to a significant degree. The results may be accounted for by the presence of a hypnotic state. The arrangement of D-scores (C1 falling between E and C2) suggests the following interpretation: hypnosis results in

changes in meanings assigned to concepts; this change is "carried over," though to a lesser degree, after the state is terminated.

In addition, hypnosis seems to have a spontaneous effect on S's perceptions of himself ("My Self," "My Body"). Although the change in the evaluative factor toward the negative pole is not consistent with the findings of Markwell (1965), it may reflect the decreased defensiveness often noted in the hypnotic state, and the effects of neutral hypnosis upon the ego-state. Such an alteration is what White (1941) considered central to hypnosis.

Shor (1959), in his theory of hypnotic behavior, drew upon the notion of a dissolution of the normal frame of reference—the altered state—as the core of hypnosis. This core factor allows experiences to take on meanings different from normal. The evidence of other studies (e.g., Sarbin, 1939; Schneck & Kline, 1951; Ludwig & Levine, 1965) and the present experiment indicates that changes in the meanings assigned to concepts, experiences, etc. is a consistent result of hypnotic induction.

However, it is change in meaning *in general* that is central, rather than change in the meaning of a *certain set* of concepts, or of particular factors. One exception to this statement may be made with regard to the

self-concept. As suggested above, the change in evaluative ratings for "My Self" perhaps does not indicate a change toward negative appraisals so much as it implies a decrease in ego-defensiveness on the part of S. This decrease may then allow the meaning of "My Self" to change in a manner determined by S's peculiar selfstructure or personality. Since it is a reasonable assumption that meanings are assigned to concepts and experiences after they have been referenced to the self, a change in self-concept would predict other shifts in meaning as well ("Love," "Hate," "Sex"). These latter changes need not be consistent or systematic across Ss. In brief, a shift in self-image, characterized chiefly by decrease in ego-defenses, may be the only consistent, systematic change produced by hypnosis in the dimension of personality.

In conclusion, there is some evidence in the present study which contributes to the evaluation of hypnosis as an altered state of consciousness. It has been suggested (Stoyva & Kamiya, 1968) that one of the indices of an altered state is a change in mental contents. A change in the dimension of meaning is, in turn, an aspect of a change in mental content. Hypnosis seems to produce a spontaneous distortion of the semantic space of the individual S, the quality of which is determined by S's particular personality structure.

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