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HYPNOSIS, DEPTH PERCEPTION, AND PSYCHEDELIC EXPERIENCE

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Although mystic states have been experienced and sought by men in all cultures throughout history, the experiential variables which determine them are poorly understood. The technology for producing these altered states of consciousness is well developed and ranges from the rites of witchcraft to the practices of Yoga. The relatively easy success of all of these methods in producing these states has resulted in accounts of them in which the changing sequences of experience are slighted in favor of the putative goals of the induction of the experience.

The recent emphasis on pharmacological means for producing psychedelic conditions has brought along with it a spate of explanations couched in biochemical and neurophysiological terms. While the changes induced by these psychedelic substances may correlate with the patterns of biochemical and neurophysiological events observed, from the standpoint of the experiencing organism they involve events of a totally different kind. Consciousness may depend upon the functioning of the reticular formation, but it is not just the sets of events in the reticular formation. In fact, in order to produce more accurate mapping of the neural substrate, it is important to delineate what changes of experience occur in response

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to particular kinds of stimulation and how the succession of these changes interacts with the changes themselves.

Data on the action of many hallucinogens (Ban, Lohrenz and Lehmann, 1961; Cohen, Silverman and Shmavonian, 1962; de Ropp, 1957; De Vito and Frank, 1964; Lawes, 1963; Malitz, Esecover, Wilkens and Hoch, 1960; Ostfeld, 1961; Savage, 1955) have shown characteristic spectra of behavioral effects for each drug which may be modified by the range of behaviors exhibited by each individual subject and by the situation in which the drugs are administered. These characteristically involve alterations in both the form and content of thought, emotional changes, changes in time perception, changes in the perception of space, and distortion of body image. Hallucinations in a number of sensory modalities are reported which may derive from physical anomalies or other characteristics of the perception are noted in most of these accounts, although it is often not clear just how space seems distorted.

As part of a program in which the effects of hypnotic suggestions of perceptual and conceptual change on behavior are being studied (Aaronson, 1964), the effects of suggested alterations in depth perception were considered. A 22-year-old well-trained male hypnotic subject was told that the dimension of depth was gone. He at once showed marked schizophreniform behavior with catatonic features. Left alone for a second in a room as he lay down, he perceived the ceiling and walls closing in on him. Much of his behavior seemed reminiscent of that reported by Beers (1950) about the onset of his own psychosis in *The Mind That Found Itself*, a book that the subject had never read.

When the dimension of depth was expanded, a psychedelic state resulted similar to that described by Huxley (1954) in *The Doors of Perception*. Lines seemed sharper, colors intensified, everything seemed to have a place and to be in its place, and to be esthetically satisfying. The hand of God was manifest in an ordered world. It should be stressed that this subject knew nothing about the reported effects of psychedelic substances nor of Huxley's experiences.

None of these changes occurred when blurred vision or clear and distinct vision were suggested. The former yielded a hysteroid condition, the latter an anxiety reaction. Hypnosis without any suggestions of behavioral change produced no behavioral effects at all.

The present study deals with two attempts to replicate these phenomena. The first set of studies was carried out with a conventionally hypnotized subject, the second with a simulator, unhypnotized, but instructed to act out the suggestions. If similar results were obtained with these subjects, then it could be asserted that the phenomenon has some generality and that

the experience of expanded depth is related to the development of psychedelic experiences.

METHOD

Two subjects were employed in this study. The hypnotized subject was a 22-year-old English major. He had little background in psychology and had spent one summer previously as a recreational aide at a ward for disturbed children. His favorite activity was painting and he hoped to make this a vocation. In personality, he was a hypomanic, extroverted person, who was always ready to turn any situation into a party. At the time the experiments reported here were begun, he had been a subject in this series for about $3\frac{1}{2}$ months.

The role-playing subject was a 22-year-old English major who had just graduated from college. He had no background in psychology. He had some previous experience in acting, but was not a method actor. In personality he was a brooding, irritable, introspective individual with good capacity for self-observation and good verbal facility. He was chosen as a simulator after extensive attempts at hypnotizing him failed to produce anything deeper than a light trance.

In carrying out these studies, the subjects first completed a Q-sort based upon Plutchik's (1962) theory of emotions. They then were administered a battery of visual perceptual tasks, including a test of depth perception. The subjects were then hypnotized, amnesia for all previous hypnotic experiences was suggested, and a posthypnotic suggestion of perceptual change imposed.

A two-hour free interval then followed. In the case of the hypnotized subject, the painting of a standard scene, the view from the windows of the room in which the experiments were conducted, was requested at the end of $1\frac{1}{2}$ hours. The subjects then went for a ride in a car over a standard course and then wrote an account of how their day had been. They were then interviewed by an outside observer,* a trained clinician who conducted an independent clinical evaluation of each subject. He knew that the subject had been hypnotized, but did not know what, if any, suggestion had been imposed.

After the interview was completed, the Minnesota Multiphasic Personality Inventory (MMPI) was administered. The Q-sort and perceptual battery were readministered. The subject was reinterviewed by the experimenter,

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rehypnotized, and the earlier posthypnotic suggestions removed. The subject was then reinterviewed about his experiences and any residual feelings were dealt with. The simulator then wrote a secret account of what his day had really been like. The elapsed time for all these procedures ranged between $5\frac{1}{2}$ to 7 hours.

The conditions involved in this series included *no depth*, *expanded depth*, *blurred vision*, *clear and distinct vision*, and two *control* sessions. The instructions for *no depth* were, "When you open your eyes, the dimension of depth will be gone. The world will seem two-dimensional." The instructions for *expanded depth* were, "When you open your eyes, the dimension of depth will be expanded. Have you ever looked through a stereoscope? Do you know what depth looks like there? That's how the world will seem to you." The instructions for blurred vision were, "When you open your eyes, everything you look at will seem blurred." The instructions for *clear and distinct vision* were, "When you open your eyes, everything seem clear and distinct." In the *control* conditions, the subjects were hypnotized, but no suggestions of perceptual change were imposed.

RESULTS

Because of the extensive amount of data collected and the limited amount of space available in which to present these data, I shall attempt to summarize the responses to each of the conditions without specific reference to the tests employed. They form a part of the evaluation, but will be referred to only when appropriate. The order in which the conditions are presented does not reflect the order in which they were imposed for each subject, but has been adopted for didactic reasons.

When the *expanded depth* condition was imposed on the hypnotized subject, he became very happy. He seemed uncertain of himself in his adjustment to space at first, but quickly adapted. Space seemed to extend through and beyond any physical limitations imposed on it. He tended to become confused in large open areas, but was able to contain his confusion in more limited spaces which the suggestion rendered more beautiful. Colors seemed intensified, lines more distinct, and sounds crisper.

The consciousness expanding effects and the personality change noted with the previous subject were not observed. He did report, however, that when his eyes were closed, he felt larger and seemed to himself to be growing. He also reported that he was able to contain the experience by painting it, and that this was a function his painting served for him.

Because this condition was induced much earlier in the hypnotic series

than was the case with the previous subject, and because the painting had helped him to contain the suggestion, the condition was reinduced four months later. This time he was not allowed to paint. All of the phenomena noted previously were reported. In addition, he began to talk about how everything around him seemed to have been shaped into a world of superreality and unspeakable beauty. In his account he remarked,

Riding in a car was like taking a wonderfully exhilarating roller coaster ride to everywhere. The landscape was at once a gargantuan formal garden and a wilderness of irrepressible joyous space. Even now, I feel dumb struck and preposterous in trying to describe this perceptual miracle which has somehow been given me. My feelings and perceptions are unspeakable....

This time he seemed to become euphoric and many of the phenomena noted by Huxley and others under psychedelic drugs were noted by him. The outside observer and the MMPI both concurred in suggesting a euphoric, creative state.

The simulating subject became rather happy under this condition. He became involved with the shapes of objects and the relation of objects to space. As he did this, he found himself becoming less self-concerned and more concerned with people and their relationships to one another. He became more alert, active and involved. He found that by concentrating on perspective and the relation of lines and sizes to one another, he was able to actually change the usual way he perceived depth. He felt that the experience had made him aware that the world we live in is three- and not two-dimensional. He felt, too, that the perception of depth is itself an illusion. The outside observer felt that he seemed somewhat happier and more spontaneous. The MMPI suggested a decline in obsessiveness.

Induction of the *no depth* condition with the hypnotized subject produced a sense that everything was flattened out which he attributed to excessive fatigue from the final exams which he had just completed. Colors, shapes, and sounds all seemed less intense. He reported a loss of sensitivity to touch. He became bored, withdrawn, and hostile. He painted the standard scene under 'protest. He was again able to use the painting to enable him to contain the experience. He also used his experience as a painter to permit him to orient himself in this altered world. The outside observer reported a bored withdrawal. The MMPI showed little change.

The *no depth* condition was reintroduced about four months later for the same reasons noted before in this paper. This time he was not allowed to paint. The responses observed before were repeated in much stronger form. He became apathetic and withdrawn. He showed little affect. He did not seem hostile, but felt that his environment had become alien and the people around him dehumanized. The outside observer felt that something similar

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to a schizophrenic reaction had occurred and the MMPI profile supported this interpretation.

When the simulator was given the *no depth* instruction, he became extremely hostile, apathetic and withdrawn. He felt bored, uninterested in anything, and unwilling to become so. He reported in his private diary that he had capitalized on an initial feeling of depression and exacerbated it. The outside observer and the MMPI raised the question of an ambulatory schizophrenia.

Under the first *control* condition, the hypnotic subject seemed happy and quite normal. This condition was run over a period of two sessions. During the interval between the first and second session, spring had burgeoned. As the second session was run with a time regression back to the time of the first session, the subject seemed confused by the way the trees had put forth leaves since the morning. The outside observer wondered if he had been given some kind of strange instruction to see green. The MMPI showed no change.

Under the *control* condition, the simulator, too, showed no change from his normal state. The outside observer and the MMPI both concurred in the no change observation.

Clear and distinct vision produced an elevated mood in the hypnotic subject. His painting of the standard scene shows his increased sensitivity to colors and textures. An elevated mood was noted by all, including the MMPI.

The simulator responded to this condition with an increased interest in his environment and in working. In his private diary he reported that by investing himself in his environment, he had succeeded in overcoming an earlier feeling of depression. The outside observer and the MMPI suggested more energy and more involvement.

When the *blurred vision* condition was imposed on the hypnotic subject, he attributed the blurring to his hay fever. Apart from a mild condition of belle indifference, he showed little change in mood, affect or behavior. The standard scene painting suggests the blurred quality of the environment rather well.

The simulator withdrew from the environment under the *blurred vision* instructions. He became uninterested in anything around him and unmotivated to do anything in particular. He was hostile to others and resistant to even minor demands that they might place on him. The MMPI and the outside observer record a movement in a schiziod direction.

The hypnotic subject was euphoric before the second *control* condition was introduced because of the kind of day it was.

No change was observed from his original high mood by any person or test all day.

The simulator was in a good mood when the second *control* condition was induced, and his mood became better as the day progressed. No change in behavior or personality was noted.

DISCUSSION

The data suggest that expanding depth yields a psychedelic experience, while ablating depth yields a schizophreniform response. These responses are not produced by suggestions of clear and distinct or of blurred vision, or by hypnotizing someone without accompanying suggestions of perceptual change. All three subjects responded in much the same fashion to the suggestions of *no depth* and *expanded depth*. The hypnotic subjects responded in similar fashion to *blurred vision*, while the simulator did not. The second hypnotic subject and the simulator responded in a similar fashion to *clear* and distinct vision, while the first hypnotic subject did not.

Heightened depth perception seems accompanied by a general increase in the overall clarity of perception in all modalities. This heightened clarity is in itself not sufficient to account for the observed effects, as the response to the *clear and distinct vision* condition shows. The important variable seems to be the relationship of the objects in the environment to space and the manner in which they seem to interact with it. The usual perception of objects in the environment as things in themselves, independent of their surroundings, seems replaced by a perception of objects as being in interaction with their surroundings and with the active properties of the space around them. The account of the simulator suggests that necessary to the development of these conditions is an interest in and an investment of the self in the objects of the environment, so that "the Universe grows I."

The *no depth* condition seems accompanied by a general dulling of perceptual experience. The crucial variable here in determining the schizophreniform response seems to be an increased insubstantiality of all objects in the environment, including the self. *Blurred vision* in and of itself does not produce a schizoid pattern of behavior unless there is a failure to interact with an environment that has become without relevance. The decreased relevance of events in the environment is associated with a tendency to respond to all attributes of stimuli in much the same way. This kind of general response is attainable if the intensities of stimuli can be reduced to a point at which the same no response can be given to all of them. The hallucinogenic drug, Sernyl, was originally developed for its anaesthetic properties (Greifenstein, De Vault, Yoshitake, & Gajewski, 1958), but it was soon observed that the reduction of stimulus input produced schizophreniform responses. The contrast between the response to the expanded depth and the ablated depth conditions involves a contrast between mystic experience and psychosis. The psychedelic substances, such as LSD, were originally called psychotomimetics (Osmond, 1957) and regarded as providing a chemical model for psychosis. These data suggest that a valid distinction may be drawn between psychotomimetic agents, such as Sernyl, and psychedelic agents, such as LSD. Far from being the same, mystic experience seems the opposite of psychosis. Mystic experience seems characterized by profound involvement and expansion of the boundaries of self, psychotic experience by profound alienation and shrinking of the self boundaries.

The fact that the effects from a later induction of a hypnotic state are more profound than those from an earlier induction suggests the importance of the training procedures involved in many of the formal systems for inducing mystic experience. Kroger (1963) has pointed out the similarity of the systems of inducing religious experience in many of the world's religions to systems of autohypnosis. The fact that one subject was able to contain the experience by painting also suggests the importance of selfexpressive devices to enable the organism to contain events that might otherwise overwhelm it. It also suggests the reason that many systems for inducing mystic experience require their aspirants to forego such expression while the experience is being sought.

The fact that expanded depth is associated with mystic experience recalls the observation of William James (1902) that most mystic experience tends to occur outdoors. The traditional predeliction of religious devotees for mountain tops and desert places may not be merely a desire to get away from the distractions of the social world, but a movement to a place where experiences of enhanced depth are possible. The traditional association of mountain tops with the abode of Deity may be less because they are higher than the areas around them than because they make possible those experiences of expanded depth in which the self can invest itself in the world around it and expand across the valleys.