

The Control of Nocturnal Dreaming by Means of Posthypnotic Suggestion

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Scientific research is carried out with two basic kinds of procedures. One is the observational or correlational approach, where we observe "what happens naturally" and try to make sense out of it by finding relations or correlations between various aspects of our observations. The other approach is the functional method, where we actively manipulate one factor or variable and note the effect on some dependent variable. Both approaches are used in most fields of science, as they complement one another, but the functional approach usually is more productive and precise.

Dream research has been almost exclusively a matter of correlational research, ignoring, for the moment, the last decade's research using the EEG (electroencephalogram) and rapid eye movement (REM) technique. Researchers asked subjects (Ss) how often they dreamed in color, whether their dreams were mainly pleasant or unpleasant, etc., and then attempted to correlate these observed characteristics with personality traits, intelligence, age, etc. Or a patient brought in a spontaneous dream and the therapist-researcher attempted to "interpret" it in the light of what he knew about the patient.

Parapsychological work with psychic dreams has been almost exclusively a matter of collecting such dreams as occurred spontaneously and focusing on whether or not there was a paranormal element in them. There has been some work on the psychological characteristics of psychic dreams (Rhine, 1962; 1965), and recently the Maimonides group and others have engaged in exciting work on telepathic dreams in the laboratory (Dean, 1964; 1965; Ullman, 1965; 1966; Ullman, Krippner and Feldstein, 1966). Even these pioneering studies in the laboratory have not, however, worked with the dream itself: the dreams pretty much happen "naturally," and it is the activity of an external agent which is manipulated.

If we could gain active control over the content and process of nocturnal dreaming we could learn a great deal about the nature of dreaming from the general psychological point of view (Tart, 1965b). From the parapsychological point of view, such techniques would show promise in leading toward laboratory production of "lucid" dreams, psychic dreams, and out-of-the-body experiences. This paper will review the work on

posthypnotic suggestion as a promising means of attaining this goal.

There are two convenient categories under which attempts to influence stage 1 dreaming can be subsumed. One is attempts to influence the *content* of dreaming, *what* is dreamed about. The second is the *process* of dreaming, independent of the particular content, by which is meant the starting and stopping of dreaming, its duration, its cyclical nature, and the mental and physiological processes which comprise and accompany it. Thus in the first case you may attempt to have your S dream about driving a red convertible, while in the second you might try to have him begin stage 1 dreaming immediately after falling asleep, instead of the usual 90 minutes later.

There have been a number of studies in the past decade using the EEG and REM technique to influence the process and, to some extent, the content of stage 1 dreaming. Most famous, perhaps, is Dement's dream deprivation technique (Dement, 1960) where the S is awakened every time he begins stage 1 dreaming. Others have worked with total sleep deprivation (see, e.g., Berger and Oswald, 1962; West, Janszen, Lester and Comelisoorn, 1962), presenting stimuli to dreaming Ss (Dement and Wolpert, 1958), social isolation (Wood, 1962), and various drugs such as alcohol, caffeine (Gresham, Webb and Williams, 1963), and amphetamine (Rechtschaffen and Maron, 1964). These have been reviewed elsewhere (Tart, 1965b). So the question arises, "Why try hypnosis?"

The main reason is that hypnotic suggestion, judging by some earlier literature, offers a hope of a much more *precise* type of control than these other variables, all of which tend either to disrupt the sleep-dream cycle completely or to have rather nonspecific effects. It should be emphasized, though, that hypnosis is not the only psychological technique which might be useful for affecting dreaming, and, certainly, many of the effects which are customarily produced by hypnotic suggestion can probably be produced, to some extent and with some Ss, without it. But hypnosis is known to be a powerful psychological technique which is convenient to use in the laboratory, so it seemed a good place to start in the search for a powerful and precise psychological technique for affecting dreaming.

HISTORICAL BACKGROUND

Prior to 1961, almost all the literature on the effects of posthypnotic suggestion on nocturnal dreaming consisted of studies carried out by psychoanalysts, more for the purpose of demonstrating Freudian principles than for an open observation of what happened naturally. This literature all purported to show that some Ss would dream at night in accordance with the posthypnotic suggestions given them, and that most of the dreams distorted these suggestions in accordance with

Freudian principles of disguise, displacement, etc. Besides being rather anecdotal, this literature suffers from the drawback that all the dreams reported might have occurred in a hypnotic state at night, rather than being stage 1 dreams. There had been no EEG recording. Indeed, Schiff, Bunney and Freedman (1961), using EEG monitoring, reported that when they gave a posthypnotic suggestion to dream about a certain topic during sleep to their *S*, she actually "dreamed" in a hypnotic state, although she thought it was during sleep. Thus the best conclusion that could be drawn in 1961 was that posthypnotic suggestion *might* influence stage 1 dreaming, but there was no proof of it. The other results reported in these psychoanalytically oriented studies might apply only to hypnotic dreams, as well as having numerous and serious methodological shortcomings (discussed more fully in Tart, 1962; Tart, 1965a).

Shortly after I had begun working late in 1961 with posthypnotic suggestion to influence stage 1 dreaming, I discovered that the basic question of whether it would work at all had been answered in a pioneering dissertation completed that year by Johann Stoyva at the University of Chicago. Stoyva (1961; 1965) showed that posthypnotic suggestion could, for some *Ss*, markedly influence the content of their stage 1 dreams. He would suggest, e.g., that they dream about climbing a tree, and his *Ss* would report that they were dreaming about climbing a tree when awakened from stage 1 dreaming. There was considerable variation from *S* to *S* in the extent to which their reported dreams were influenced by the suggestions, of course, but this work was the first concrete illustration of the potentials of posthypnotic suggestion as a powerful and precise tool for affecting stage 1 dreaming.

AFFECTING DREAM CONTENT

In the fall of 1961 I carried out a study designed to compare responses to hypnotic suggestions to dream about specified topics during hypnosis with responses to *posthypnotic* suggestions to dream about the same or similar topics during stage 1 sleep. This design also tested the extent to which posthypnotic suggestion could affect stage 1 dreaming, which is our interest here.

Ten *Ss* were selected from a much larger group of students by means of suggestibility tests and trained to reach a deep hypnotic state. Each *S* then participated in two individual experimental sessions. In the one of interest here, he was hypnotized and told to dream during his natural sleep that night about a stimulus narrative, which was immediately played on a tape recorder. The narrative placed the *S* in a threatening situation which evoked a realistic fear of bodily injury or death. It was emphasized that he would dream about the stimulus narrative in his *natural* sleep that night, and *not* in a hypnotic state; in fact, amnesia for the whole hypnotic

session was suggested. No suggestions to "disguise" the dream (in the Freudian sense) were given, explicitly or implicitly. The *S* was then dehypnotized, and slept in the lab for the night. Whenever his EEG and REM patterns indicated stage 1 dreaming, it was allowed to go on for a few minutes and then he was awakened for a dream report. A reliable method for judging how well the reported dreams conformed in detail to the stimulus narrative was worked out (judges correlated .99 with each other), and all these dreams scored on it.

For five of the ten *Ss*, not a single element in their reported stage 1 dreams corresponded directly to anything in the stimulus narrative, nor did any of these dreams appear to be disguised or distorted versions of the stimulus narrative.*

The other five *Ss*' dreams were affected, ranging from a minimal effect of two elements of the 23 in the stimulus narrative appearing in a reported dream to a high of 13 of the 23 elements appearing in another reported dream. Two of the five *Ss* had only a single stage 1 dream of the night affected, two others had two stage 1 dreams affected, and the fifth *S* had all five of his stage 1 dreams strongly affected.

These bare figures do not capture some important characteristics of the data, however, so I must add some qualitative impressions. The reported dreams, even those showing the greatest effects of the posthypnotic suggestions, were not straightforward reproductions of the stimulus narrative. Rather, there was considerable embellishment. The best *S*, e.g., constantly added a happy ending to the dreamed about stimulus narrative, rather than being left stranded in a fearful situation! At the low end of the response continuum, we have a few details of the stimulus narrative appearing in a dream that seems otherwise unconnected with the experimental situation. At the high end, the complete outline and theme of the stimulus narrative dominate the dream, yet there is still considerable embellishment and modification. It is as if the resulting dream were a product of a conflict between the suggested narrative and an autonomous, natural dream process which has, as it were, material of its own to present during the time of dreaming.

Details of this study may be found elsewhere (Tart, 1964b).

These findings were confirmed and extended a year later when I did some further work (Tart, 1966) on this, using the one *S* who had responded so well before and one new *S*. An emotionally neutral stimulus narrative was used this time, but the results were essentially

*This is a moot point as no associations were obtained from the *Ss*, and the dreams may have been so thoroughly disguised that I couldn't see the connection. But, if this was the case, it is atypical compared to the earlier psychoanalytic reports, in which the sophisticated reader could see a connection between the "disguised" dreams and the stimulus narratives even without benefit of the free associations.

the same: the dreams were dominated by the theme of the stimulus narrative, but considerable addition and modification appeared. It was interesting to note, however, that the new *S*'s reported dreams showed much less modification and embellishment than the other *S*'s; they were much more a "straight playback," and this seemed to parallel the lack of initiative and passivity that this *S* displayed in his interpersonal relations.

AFFECTING THE PROCESS OF DREAMING

Having found that posthypnotic suggestion offered great promise for affecting the content of stage 1 dreaming, the next step in surveying its potential was to attempt to influence the *process* of dreaming. Some basic aspects of *any* process are its starting, stopping and duration, so in the latter part of 1962 I worked intensively with two *S*s, attempting to start, stop, and modify the duration of their normal stage 1 dreaming (Tart, 1966). Both of these *S*s were good hypnotic *S*s, and could have the content of their dreams strongly affected by posthypnotic suggestion.

It is well-established now that the sleep-dream cycle of most normal *S*s is quite stable, and essentially unaffected by normal variations in day to day activities (Dement, 1960; Hartmann, Verdone and Snyder, 1966; Williams, Agnew and Webb, 1964; Wood, 1962). Each stage 1 dreaming period begins at approximately 90 minute intervals after the start of sleep, each dreaming period gets longer than the previous one, and the total amount of time spent in stage 1 dreaming (20-30% for young adults) is constant from night to night, within a few percentage points for a given *S*. For the two *S*s in this study, one showed a mean of 30% dream time with a standard deviation of 3%, the other a mean of 28% dream time with a standard deviation of 5%. These data are based on eight baseline nights for each *S* in which the only posthypnotic suggestion given was to sleep normally.

The design called for each *S* having two nights each on four types of posthypnotic suggestion: (a) wake up at the end of each dream; (b) wake up at the beginning of each dream; (c) dream all night long; and (d) don't dream at all.*

Let us first look at the results of the wake up suggestions, taken together. These showed a powerful effect. The two *S*s never awakened on their eight baseline nights, but awakened a total of 27 times, or an average of three awakenings per experimental night, on the wake up nights. The precision of this effect is a little more difficult to evaluate, due to such ambiguous responses as awakening from periods when body movement had obscured the EEG record for some time, or awakening from nonstage 1 sleep on wake-at-start nights at a time

* One of them had three nights of dream-all-night and only one night of don't-dream, so the result later noted for the dream-all-night suggestions is based on this *S*'s three nights.

when a stage 1 period was "expected," so a variety of criteria were used to evaluate the precision of compliance with the wake up suggestions. By the most stringent criteria, 31% of the awakenings represented perfect compliance with the suggestions; by the most generous criteria, this figure is 90%.

The don't-dream suggestions had no significant effect with either *S*, and the dream-all-night suggestions had no significant effect with one *S*. For the other *S*, however, there was an increase in stage 1 dream time, on the order of half an hour per night, a 21% increase over baseline nights, which was statistically significant by a variety of tests. This is still far short of dreaming *all* night, though. Stoyva (1961; 1965) noticed a shortening effect of approximately equal but opposite magnitude to this one as a result of suggestions designed to affect content, and Rechtschaffen and Verdone (1964) found an effect of about the same magnitude as a result of offering *S*s cash awards for increasing or decreasing the amount of time they spent dreaming. Although we need more data on this, one can speculate that the timing and duration of stage 1 dreaming is basically under physiological control, and the sorts of psychological variables one can use in the laboratory may not be able to modify this physiological control more than about 20%.

The technique needs further development, of course, but at present we can conclude that posthypnotic suggestion is a powerful tool for terminating stage 1 dreaming by arousal, and shows promise of being fairly precise as to whether it occurs at the beginnings or ends of the dreams. Insofar as affecting dream duration, though, it does not seem to be a powerful tool, and the results are not very impressive.

As with the content effect, some intriguing aspects of the data are not encompassed by these figures. Granted that *S*s were able to awaken at the beginnings and ends of their dreams fairly well, how did they do it? How did they distinguish the beginnings and ends of their dreams, and how did they arouse themselves into wakefulness?

The physiological measures (EEG, REMs, and basal skin resistance) suggest that some of the discriminations may have taken place in an awake or half-awake state, as some of the awakenings were preceded by long stretches of body movements, obscuring the EEG record and making it impossible to be sure the *S* was physiologically asleep. But a number of arousals took place within a few seconds from clear stage 1 dreaming, so we must turn to our only other source of data, the dreams reported from these awakenings.

Before starting the study, I hypothesized that the dream content would show some sort of change just prior to the *S*'s awakening, perhaps a report of a change in "dream consciousness" or a symbolization or representation of a change of consciousness—going through

a door, climbing a ladder, hearing an alarm clock, or the like. Much to my surprise, I could find nothing in the reported dreams which shed any light on the discriminative or arousal processes. The dream action would be going along at its own pace, and all of a sudden the *S* was awake and saying to me, "I'm awake now." Judgments of the "completeness" of the reported dreams indicated that those reported from wake-at-end nights were significantly more complete than those from wake-at-start nights, as well as taking significantly more words to describe, but aside from this, I have no idea of how the *Ss* discriminated the beginnings and ends of their dreams and aroused themselves. It is tempting to speak of some process of judgment "disassociated" from dream consciousness, but this really *explains* nothing at this stage of our knowledge.

To sum up briefly: posthypnotic suggestion, although fully applicable with only a limited number of *Ss*, shows great promise as a technique for affecting and controlling the content of stage 1 dreaming and at least one aspect of the process, viz. awakening. The effects are fascinating in themselves, and of use, once the technique is perfected, in a variety of functional studies of dreaming.

PARAPSYCHOLOGICAL POSSIBILITIES

The potentials of experimental control over the process and content of nocturnal dreaming are of particular interest with respect to three parapsychological phenomena, the psychic dream, the "lucid" dream, and out-of-the-body experiences (OOBEs). These will be discussed in order.

In almost all cases of psychic dreams there is a potent, outside instigating stimulus applied to a passive sleeper. That is, the subject is sleeping and going through his natural sleep-dream cycle, not expecting anything unusual, but events, frequently traumatic, occur to someone else and these events or the someone else, acting as agent, presumably initiate an extrasensory stimulus which instigates a dream or affects the content of an ongoing dream in such a way that the dreamer is impressed enough with his dream to check it out, and then discovers the paranormal information in the dream. Thus the initiative lies with the external events and/or agent.

In a few cases there is a more specific psychological focusing of the subject toward the events or person(s) who will initiate the extrasensory stimulus. In a spontaneous case I reported (Tart, 1964a) the subject was preoccupied with the expectation of seeing the agent the next day, thus going to sleep with a psychological set which may have aided or initiated the extrasensory process. In the Maimonides experiments (Ullman, 1965; 1966; Ullman, Krippner and Feldstein, 1966) and Dean's experiment (Dean, 1964; 1965) the subjects knew that an agent would try to influence their dream-

ing that night, and thus also carried a relevant psychological set into sleep. It is quite possible that this psychological set to respond to the extrasensory stimulus may be very important in producing the highly successful results that have been reported.

Now it is clear from the work reviewed earlier that posthypnotic suggestion can set up very powerful psychological sets to do certain things during sleep and dreaming. While there is very little *direct* evidence (Stoyva, 1961) that posthypnotic suggestion is more powerful than simple waking suggestion or the set implicit in participating in a laboratory experiment concerning telepathic dreams, the best evidence currently available comparing hypnotic suggestion and waking suggestion *per se* indicates that hypnotic suggestion is considerably more powerful (Hilgard and Tart, 1966; Tart and Hilgard, 1966). Thus posthypnotic suggestions to subjects that they would be highly responsive to extrasensory stimuli from the agent might greatly increase the yield of paranormal information in the Maimonides type experiment.*

The second intriguing phenomenon of parapsychological interest that posthypnotic suggestion might bring under laboratory control is the "lucid" dream. This term was coined by Fredrick van Eeden (1913) to describe a unique sort of dream in which he felt he was perfectly conscious, lucid, and in possession of all his mental faculties *during the dream itself*. Throughout such lucid dreams he was perfectly conscious of the fact that his experience was a dream, i.e., he knew while experiencing the events of the dream that he was "really" lying in bed asleep. Yet, not only did he find himself in full possession of his normal mental faculties, he was frequently able to modify the dream experience by an act of will. The dream experience was perfectly real as it occurred, even though he knew he was "really dreaming."

Here is an example of one of van Eeden's lucid dreams:

"On September 9, 1904, I dreamt that I stood at a table before a window. On the table were different objects. I was perfectly well aware that I was dreaming and I considered what sorts of experiments I could make. I began by trying to break glass, by beating it with a stone. I put a small tablet of glass on two stones and struck it with another stone. Yet it would not break. Then I took a fine claret-glass from the table and struck it with my fist, with all my might, at the same time reflecting how dangerous it would be to do

* If a posthypnotic set to be highly responsive to extrasensory stimuli was combined with suggestions to wake at the end of every dream, one could carry out Maimonides type experiments without the costly investment in EEG equipment now required. The minor drawback of this design would be that one would not be sure whether any telepathic dreams obtained were stage 1 dreams or nonstage 1 type dreams, but the primary objective would be to increase the yield of telepathic dreams *first*, before worrying about the accompanying sleep stage.

this in waking life; yet the glass remained whole. But lo! when I looked at it again after some time it was broken!

"It broke all right, but a little too late, like an actor who misses his cue. This gave me a very curious impression of being in a *fake-world*, cleverly imitated, but with small failures. . ." (van Eeden, 1913, p. 448).

In this 1913 article van Eeden described a number of his lucid dreams, and later presented in fictionalized form other material pertinent to them (van Eeden, 1918). The bulk of his material has never been presented, to my knowledge, and the only other extensive accounts of lucid dreams are those of Mary Arnold-Forster (1921), so our knowledge of this intriguing phenomenon is miniscule.

The lucid dream is an extremely intriguing phenomenon in its own right, from the psychological point of view, and I plan to do some laboratory experimentation on producing it in the future. It is currently a "psychical" phenomenon in that it is virtually unknown in psychological circles but known in parapsychological circles, as hypnosis was many years ago. It may have more than traditional relevance to parapsychology, however, for two reasons: first, this unusual state of consciousness might be very favorable for the operation of psi faculties, and second, persons who have reported frequent OOBEs have often reported experiences which sound like lucid dreams, so what is learned in the investigation of lucid dreams may be relevant in attempting to experimentally produce OOBES.

OOBES are typically once-in-a-lifetime experiences for people, and so our knowledge of them has been greatly hampered by an inability to produce them at will and experiment with them. I have been fortunate in being able to study two gifted subjects in the laboratory (Tart, in press; Tart, to be published), but the initiative in producing the OOBES lay with the subjects, not with the experimental conditions. The major attempts in the past to produce OOBES have involved the use of hypnosis (Durville, 1909; Lancelin, in Carrington, 1919, pp. 146-154), but these have not been repeated in many years. In addition, attempts to produce OOBES during a hypnotic trance have produced some highly evidential material, but many failures. Further, many hypnotic subjects will produce a fantasy of an OOBES which is not the real thing, and which generally contains no indications of ESP components. And, as Hart (1953) has pointed out, there seem to be qualitative differences in even the best OOBES produced during hypnosis compared with naturally occurring OOBES.

From one point of view, it is a wonder that *any* OOBES have ever been produced *during* the hypnotic state, as these older experiments attempted to do. The spontaneous OOBES occur in a state of sleep or coma, as near as can be determined from the reports, and the

two subjects I have studied in the laboratory both showed electrophysiological evidence of producing their OOBES in a hypnagogic state in one case and a stage 1 dream state in the other. These are not states we would expect subjects to be able to talk in, yet in attempting to produce an OOBES during the hypnotic state the subject is expected to describe his experience *as it is occurring*. This would seem to preclude the physiological changes and (disassociative) mental changes which normally accompany the phenomena.

If this reasoning is correct, our most hopeful technique for experimental production of OOBES would be *posthypnotic* suggestions that the OOBES occur during subsequent sleep, with the subject waking or being awakened by the experimenter afterwards for a description of the experience. Thus the investigation of the effects of posthypnotic suggestion on affecting various aspects of sleep and dreaming may be a key to the experimental production of OOBES.

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