Twilight Learning Revisited

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If you bring forth what is within you, what you bring forth will save you; if you do not bring forth what is within you, what you do not bring forth will destroy you.

—Gnostic gospel

The late Thomas Budzynski developed Twilight Learning technology in the 1970s. Twilight Learning utilizes EEG neurofeedback to train the subject to enter a theta rhythm dominant brain state (4–7 Hz), and then presents auditory “change messages” to the individual while in this hypersuggestible state. The article reviews the scientific background from which he developed the Twilight Learning technology, including research on hypersuggestibility and enhanced learning in “twilight brain states.” The author compares the Twilight Learning approach to the Peniston Protocol, which was shown to have well-documented therapeutic effects with alcoholism and post-traumatic stress disorder.

Perhaps as long as 20,000 years ago, shamans used a variety of procedures to prepare their “clients” for the magical words and incantations that would remove the evil spirits that affected the mind, body, and spirit. Almost every one of these healing techniques could be said to be comprised of two factors:

1. The preparation, which involved the production of what we might now call an altered state of consciousness.
2. The delivery or presentation of the healing or “change message.”

A question that is not usually asked is, Why the preparation? Why not just say the magical words? Most modern scientists would agree that the majority of these primitive healing procedures were just placebo ceremonies enhanced by the preparatory exercises that often produced an altered state. Then the question might be asked, why does an altered state enhance the power of the magical words? We wondered about this question in 1970 as we struggled with the then very new cognitive therapy. Why was it that with some depressed clients the positive thoughts that were prescribed would backfire? As one client told us, “When I think the positive thought about myself a little voice says, ‘Like hell you are.’”

Little Voices, Defenses and Sleep Stages

What was this negative little voice that undid the affirmations even when they were realistic? Is this related to the common observation that conscious plans (“I’m going to lose 25 pounds after the holidays”) often seem to go awry? It seemed to us that it might have something to do with the processes called defense mechanisms by Freud. About this time some research carried out by Foulkes and Vogel (1965) seemed very relevant. At the University of Wyoming these researchers found that as people passed from full wakefulness through a drowsy Stage 1 to a deeper asleep Stage 2, they sequentially passed through distinct stages in the processing of information.

An important conclusion was that as the individual passed from wakefulness to sleep a loss of volitional control over mentation tended to occur first, followed by loss of surroundings, and finally, loss of reality testing.

Vogel, Foulkes, and Trosman (1966) examined subject reports for ego functions and concluded:

1. As individuals become drowsy and pass into sleep, their brain rhythms change from predominantly alpha, to fragmented alpha, to low amplitude theta.
2. Paralleled (though not perfectly) with these EEG patterns are sequential ego states showing an increasing impairment of ego functions.

Many others have studied the unusual properties of the twilight state. For example, Froeschel's (1949) postulated that: “rules of association radically different from the rules of the waking state govern the formation of thought in the hypnagogic state. He concluded that the unconscious plays a major role in hypnagogic thought” (p. 24).

T. X. Barber (1957) had his dissertation featured in Scientific American. His study looked at the hypersuggestibility of the twilight sleep. Barber found that subjects were just as suggestible in a light sleep or in a drowsy condition as when they were hypnotized. A quote from one of his subjects is illuminating: “I was just sleepy enough to believe what you were saying was true. I couldn’t oppose what you wanted with anything else” (p. 59).

Barber believed it was possible that suggestions could be presented to people in a light sleep to help overweight people reduce, heavy smokers to cut down, and timid people to gain confidence.

A dissertation by Felipe (1965) at Yale produced results that supported Barber’s conclusions. Testing the effects of tape-recorded attitude change information presented during waking, drowsy, and deep sleep conditions, Felipe found that the information changed attitudes toward interracial dating only in the drowsy condition.

Svyandoshch (1968), a Russian sleep researcher, has said, “Speech assimilated during sleep, in contrast to that assimilated during the waking state, is not subjected during assimilation to the critical processing” (p. 112).

The Russian scientists have studied the effects of sleep learning for years, and for years Rubin (1970) studied them. In his book Current Research in Hypnopaedia, Rubin (1968) concluded that the common denominator among successful sleep-learning studies is that “superficial sleep” (Stages 1 and 2) is the psychophysiological background for maximum receptivity. It’s interesting to note that the Russian sleep-learning technique involved repetitive sessions over weeks or months. They also placed emphasis on establishing the correct set or expectancy for learning and retention prior to the sleep session. In contrast, most sleep-learning studies in the United States, which were inconclusive, did not establish a positive set and did not incorporate multiple sessions.

**Emotional vs. Intellectual Suggestions**

Quite a while ago DeManacine (1897) was interested in the degree of suggestibility present in a drowsy or twilight state. She gave her subjects two types of suggestions while they were in transition from waking to sleeping: “intellectual” suggestions (e.g., math, such as $3 \times 2 = 5$) and “emotional” suggestions (such as, The building is burning down). A suggestion was considered successful if the person repeated the experimenter’s statement or accepted it without protest. Among adults, the intellectual suggestions were 25% successful and the emotional ones were 45% successful. However, the children showed an 85% repetition/acceptance of the intellectual suggestions and a 97% repetition/acceptance of the emotional ones (Schacter, 1976). In light of the more recent theories of left-right hemispheric functioning we might say that the children were more “right-brained” or less defended than the adults. The psychodynamic model would predict that as people grow into adulthood, they layer on more defenses, which operate even down through the unconscious levels of the mind.

**Sperry and Galin: The Unconscious and the Right Brain**

The 1960s and 1970s were a period of time of incredible discoveries about the human brain. Roger Sperry of Cal Tech received the Nobel Prize for his research on the lateralization of function in the left and right hemispheres. David Galin, in a landmark article in the Archives of General Psychiatry (1974), brought all the new lateralization facts to bear on Freud’s model of the unconscious. The functions of the nondominant hemisphere did indeed appear to provide a good fit with Freud’s model (Budzynski, 1976, 1986). Even the great neuroscientist Sir John Eccles noted, “Strictly speaking, therefore, we can state that the actions effected by the right cerebral hemisphere are unconscious actions” (1976, p. 118).

A more recent update of this model was forwarded by neuroscientist and clinician R. Joseph (1992), who noted in his book, The Right Brain and the Unconscious, “Indeed, a few neuroscientists and researchers who specialize in the study of the brain (such as I) have argued that the so-called unconscious mind is in fact a manifestation of right-brain and limbic-system mental activity” (p. 21).

Given that the right brain appears to play a major role in the implementation of unconscious process, and that much of the “deep rooted” negative self-image and early trauma material is buried in the unconscious, how does one get past the critical-screening left hemisphere in order to change the negative scripts into more positive, adaptive ones? Interestingly, our development of Twilight Learning preceded the brain lateralization breakthroughs of the mid-1970s. The rationale for the device was based in part on the hypnosis literature, and on the dynamic model postulated by Freud and examined by Foulkes and Vogel as noted above (Budzynski, 1971, 1972, 1986).
Additional research considered in the design included the vigilance studies of Dimond and Beaumont (1972, 1974). In the early 1970s these researchers carried out an interesting series of studies using a vigilance paradigm. They managed to separate left and right hemispheric performance on vigilance tasks. This is what they concluded:

The left (hemisphere) is capable of sustaining high levels of performance, but as intense activity to detect small and infrequent signals from the environment is particularly demanding, performance cannot be consistently maintained, and hence, the decline sets in.

The right hemisphere, however, while apparently not capable of such high levels of performance, unless sustained by the left, maintains its performance steadily, beyond the point at which performance of the left hemisphere has deteriorated seriously. The right hemisphere appears therefore to provide a skeleton service in vigilance, a minimum service capable of maintaining performance after decrement occurs in the left hemisphere (p. 69).

These vigilance studies lent support to the concept that the right hemisphere remains functioning at cortical arousal levels, which are either too high or too low to support critical thinking in the left hemisphere. The key, then, to the puzzle of why the high arousal of some primitive healing ceremonies or the low arousal of Stage 1 sleep should produce a hypersuggestibility may be the fact that significant changes in cortical arousal, either high or low, result in a shift from left dominance to right. This premise was diagrammed in a Psychology Today article (Budzynski, 1977), and a later chapter on hemispheric asymmetry and restricted environmental stimulation (Budzynski, 1990).

Essentially, one can imagine a continuum of functional cortical arousal level range that is smaller for the dominant hemisphere, i.e., this hemisphere’s proper functioning requires an arousal level that is neither too high nor too low. In contrast, the nondominant (usually the right) hemisphere can function at both higher and lower arousal levels than can the dominant. The “windows” at the high and low ends exist at the levels where the left cuts out but the right is still functioning. It is at these windows that critical screening and many of the defense mechanisms are inactivated, yet these windows also permit the change message (whether taped affirmations or the therapist’s voice in the microphone) to be absorbed as best it can by the right or nondominant hemisphere. Hypnosis using a deep relaxation induction would be one example of rescripting through the lower window.

Hypnosis and Lateralization

Based on the explosion of left-right lateralization research and theorizing, we wondered if stand-alone EEG feedback machines with digital quantifiers could detect switching in lateralization as subjects were hypnotized. We hypothesized that individuals entering the hypnotic state would show a shift toward increasing right hemisphere activation. If so, it would fit the model we were refining that postulated that a predominant shift toward right brain dominance would be characterized by an increase in the left/right (L/R) alpha ratio and an increase in suggestibility. In 1974 we used two Alpha/Theta (AT-1) stand-alone feedback units driving two Digital Quantifiers to measure accurately the alpha band voltage from the T3–T4 monopolar leads as subjects underwent hypnotic induction.

Figure 1 shows a typical graph of the L/R ratio as it changed from the baseline (B1) and gradually increased as the hypnotic induction proceeded. Each 5-trial block represented an average of 5–30 second samples read out on the Digital Quantifiers. The CO designation is the first average taken as the subject was “coming out” of the trance under the direction of the hypnotist.

The B2 level shows that even after awakening the L/R ratio remained higher than before the induction. We saw this effect linger as long as 20 minutes in some cases. Only one of the six subjects reported afterward that she had not been hypnotized and Figure 2 shows the graph from this session. Note that the L/R ratio actually decreases, indicating an increasing left dominance as this individual resisted “going under” as she referred to the hypnotized state.

More recent studies (Bick, 1989; Sabourin, Cutcomb, Crawford, & Pribram, 1990) indicate that high-hypnotizable subjects show more theta in their waking EEGs than low-hypnotizable subjects, although both types show increased theta, or lowered cortical arousal while hypnotized. Wickramasekera (1988) has shown that lowered frontol arousal levels increase hypnotic susceptibility.

One might conclude, if somewhat tentatively, that suggestibility increases as the nondominant hemisphere increases in activation relative to the dominant side, and/or as cortical arousal lowers.

Can a Theta State Be Facilitated?

In a 1969 PhD dissertation, Budzynski showed that the lowering of facial and neck EMG levels through EMG feedback resulted in a decrease in cortical arousal and the appearance of theta frequencies in the EEG. This phenomenon was verified in later studies (Budzynski & Peffer, 1973; Sittenfeld, Budzynski, & Stoyva, 1976), which indicated that
Does REST Do It?
In addition to the research noted above, the use of the procedure known as REST (restricted environmental stimulation) has contributed to the body of knowledge supporting the model of the brain that hypothesizes an increase in suggestibility as cortical arousal lowers. REST is usually taken to mean the sensory deprivation chamber or the float tank environment. Postulating a Dynamic Hemispheric Asymmetry model, Budzynski (1990) endeavored to show that the increased suggestibility developed in individuals in the float tank or sensory isolation chamber was the result of a change in dominance from left to right hemisphere. The basic paradigm for addictions applications involved a set for decreasing the behavior, the experience of the sensory isolation, and, in most cases, the presentation of tape-recorded change suggestions at intervals during the isolation.

Suedfeld and Baker-Brown (1987) found that 3- and 12-month follow-ups showed smoking reductions of 51% and 34% respectively. Borrie and Suedfeld (1980) had earlier shown that 24-hour chamber REST plus weight loss suggestions resulted in a greater weight reduction than just REST alone or other control conditions. Cooper, Adams, and Scott (1988) reported that only 2.5 hours of REST plus a message produced a mean reduction in alcoholic intake of 55% after two weeks. At a three month follow-up the mean alcoholic intake was reduced 61%, and after six months the reduction was still good at 59%.

We have sampled here a small amount of the large body of research, which shows that one can in various ways elicit a theta state, accompanied by hypersuggestibility, enhanced absorption, and a decrease in critical and defensive operations. This research supports the possibility of producing and maintaining such a state, in order to make changes in maladaptive habits, addictions, and poor self-image, and to set a strong course for achieving goals. This is the state where the “little voice” is not heard.

The question then becomes, “How can this state be produced reliably without hypnosis, waiting for the individual to fall asleep, or using an exhausting primitive ceremony”? A second question might be, “How could such a state be maintained for at least the better part of a therapy hour”?

Facilitated Theta and Preparatory Emotional Imagery
Bertini, Lewis, and Witkin (1969) also studied the hypnagogic or twilight state but with the goal of developing an experimental technique that could facilitate drowsiness, reverie, and free association. They reasoned that, “The transitional nature of the hypnagogic state makes it an especially fertile period for the production of primary process material. Loosened controls partly resulting from the drowsy state seem to make the primary thinking more accessible to observation” (p. 94).

Their induction technique involved the generation of a monotonous white noise and the use of “ganzfeld” glasses made up of halves of ping-pong balls to produce a homogeneous visual field. In addition to this mild sensory deprivation technique, Bertini and colleagues also stimulated their subjects with highly emotional material. With this state attained just after the presentation of the conflict material, they could study the work of the primary process in resolving the conflict. The subjects reported recall of experiences, images, and feelings from childhood, woven in with thoughts about current events in their lives. One could say that there was an integration of early emotional material with the present day adult perspective.

When we tried Bertini and Witkin’s technique we discovered that subjects either found it uncomfortable or they went to sleep. Moreover, white noise is harsh and grating on the nerves. Therefore, when we incorporated part of their technique in Twilight Learning we used a variation of white noise called pink noise. It is a softer sound, somewhat like a wave washing up on the beach.

A Serendipitous Finding That Indicated the Plasticity of the Brain
As we refined Twilight Learning, a good deal of trial and error was required. A perfect setting of the thresholds meant that the filters were adjusted such that when the individual was showing theta, the tape-recorded theta message was played. The subjective impression afterward was of being aware of having heard a voice but not recalling any of the material.

After we had found the perfect settings of the filters for my EEG, I began using a self-esteem enhancing tape each night. About the fifth session I was surprised to find that I could hear the message. Although I immediately assumed that there was something wrong in the electronics, the unit checked out perfectly.

On a hunch I had a friend do a quick single channel EEG on me. Over the years I had many such records made in the course of our studies. To my surprise, my formerly “clean” theta was now interspersed with alpha and beta. My brain
had learned to turn on the tape recorder with the theta, and it had later learned to mix in some higher frequencies so that it could consciously listen in on the message. In those years brain plasticity was not part of our model and the sole result of the discovery was that we added logic to the circuitry so that the theta recorder could not turn on if alpha or beta energy was also present in the EEG (i.e., it would only trigger on “pure” theta). The goal was a system that would be able to present verbal affirmations outside the awareness of the critical screening. It is interesting to speculate how and why my brain suddenly learned to hear the theta message. Present-day neurofeedback research has indicated the brain’s remarkable degree of plasticity and its ability to change its EEG patterning.

The Final Design
Taking into account everything we uncovered in the research from the many areas investigated, together with John Picchiottino, we designed an EEG biofeedback system that would detect 4–7 Hz theta EEG over the left hemisphere and then turn on a tape recorder with the affirmation message. The tape recorder would turn off instantly if the theta energy changed toward increasing arousal as characterized by increasing alpha and beta energy. This change in the EEG would mean that the conscious critical screening “shields” were going up and the acceptance of the affirmations would be blocked. To guard against the subject falling asleep, the system was designed to cause the volume of the message to increase as the theta frequency decreased toward delta, or if the theta amplitude increased. This “bump” circuit also had a second function. There was research to show that if a learner were to experience an increase of adrenalin right after the learning had taken place, then he or she would better remember the material (Budzynski, 1976; Koukkou & Lehmann, 1968). It is as if the “bump up” in arousal helped store the material in long-term memory. Finally, the therapist can watch the alpha/theta meter and inject his or her own voice through a microphone to the client’s headphones if he or she does not wish to use the audiotape.

Case Studies with Twilight Learning
It may be instructive to look at some actual case studies to gain insight into how the Twilight Learning procedure works. These cases span more than 20 years of clinical practice.

The Scientist with the Dual Goals
HK, a 55-year-old researcher, was seen in the clinic for chronic back pain. He had heard of Twilight Learning and wanted to try it for his pain problem. His back pain did not extend down his legs, which hinted at a possible psychogenic factor. Moreover, HK also wanted to add suggestions for weight control because he had been more than 30 pounds over his ideal weight for 25 years.

The change messages were presented together, although he was warned that usually we didn’t do multiple goals in the same session. However, HK was concerned about the cost of the therapy and stated that he “would take his chances.” After two sessions per week for three weeks, HK reported that the back pain was lessening. During the eighth session he demonstrated that he could touch the floor with his fingers. There was no more back pain and the only thing that kept him from reaching the floor easily was his girth, which had not changed.

Three more sessions did not produce any change in his weight and he decided to terminate therapy satisfied that the troublesome back pain had ceased. As we discussed the weight problem in the last session HK stated that his wife was also overweight and they had, after 32 years of marriage, settled into a comfortable relationship in which eating out had become their primary pleasure. It was then obvious that a significant loss of weight might endanger the dynamic of the relationship. Somehow, we were not as wise as HK’s unconscious. This outcome caused us to more carefully examine the possible effects of changing an individual through Twilight Learning. After defining goals we now ask the client to imagine himself having achieved the goals and interacting with family, friends, and fellow workers. If the new persona doesn’t feel comfortable, we discuss the situation and possibly change the goal somewhat before starting the Twilight Learning sessions.

The Businessman Who Couldn’t Say No
One of our earliest cases, Mr. GY, a 37-year-old individual, though moderately successful in his professional life, found it very difficult to say “no” to authority figures. Three years of psychotherapy had not resolved the problem. In the first few Twilight Learning sessions, GY experienced imagery related to a repressed early memory in which his authoritarian father slapped him viciously for saying “no” to his father’s request.

In subsequent Twilight Learning sessions, phrases such as, “It’s OK to say no,” “Saying no is good sometimes,” “I can say no when I want to,” and “I can say no to my father,” were presented during theta. After five of these sessions, the anxiety associated with turning down an authority figure had vanished.

This case illustrates that a Twilight Learning session can result in material “welling up” from unconscious memory.
stores. This unpressed trauma memory material can then be woven into the rescripting suggestions that will follow in subsequent sessions. A careful debriefing after each session is needed to identify these often subtle and fleeting feelings and images.

**The Grad Student Who Couldn’t Pass the Spanish Exam**

Graduate students at most universities need to pass exams on two foreign languages before they can get their PhDs. Mr. LG, a 24-year-old, had already flunked the Spanish exam. He had only one more chance to pass. However, he found it impossible to even sit down to study because the anxiety would build quickly. The Twilight Learning sessions were of two kinds: presentations of Spanish words and English equivalents, and the presentation of suggestions that he would be able to relax and study the material and retain it for the exam. There were approximately four sessions of each type, and he easily passed the exam. However, we later found that a twilight state is probably not ideal for rote learning, whereas attitudes about studying are more effectively changed.

**The Self-Sabotaging Businesswoman**

A local newspaper happened to do an article on Twilight Learning in which it was said that some individuals suffer from negative scripts from the past that often undermine present adult behavior. There was a surprising response to the article from a large number of readers consisting primarily of professional females. Ms. NP, a 34-year-old middle-level manager in a computer hard drive company, was typical of those clients. Her complaint was that after reading the article she realized that she had been sabotaging her own success over the last 10 years. Dropping out of graduate school to move away with her lover, she found that she soon tired of keeping house for him in another town and sought a job of her own. NP, a bright individual, rose rapidly through the ranks to become a supervisor, whereupon she reported that she had a basic disagreement with her female supervisor and was soon thereafter let go as the company downsized slightly. As she recalled, there were at least two other incidents where self-sabotage hindered or even temporarily stopped her progress. She wanted to end this self-induced maladaptive behavior.

We have found that approximately two-thirds of Twilight Learning clients want the therapist to make the affirmation or change message tape in his or her voice. However, all clients want to have a say about what is put on the tape. NP, knowing her tendency to self-sabotage wanted the therapist to make the tape. She didn’t even want to know the exact affirmations. Consequently, we made a tape using material generated over several sessions with NP. The affirmations were “heard” by NP only in the theta state. Some examples of the phrases were: “You deserve to succeed,” “It’s OK to be a success,” “You can progress now,” “You are a bright person,” and “You are in control of your life.”

After 12 sessions, NP became aware of a new feeling of self-worth and a significant decrease in the anxiety she felt in the working environment. A six-month follow-up found NP reporting no evidence of self-sabotage. In fact, she had received a promotion and a bonus.

It has long been known in the hypnotic literature that subjects given amnesia for post-hypnotic suggestions are more likely to carry out the suggestions than those subjects who were allowed to remember them. It would seem that when the conscious brain is aware of the suggestions, the defenses may interfere with their implementation. In the same fashion, the defenses of certain clients might reject the affirmations if known by the conscious mind before the Twilight Learning sessions. These clients would benefit more by having the therapist make up the affirmations and record them without the client knowing the exact affirmations. Conversely, another type of client insists on generating, with the help of the therapist, the actual phrases, and even wants to record them in his or her own voice. The most common choice however, is for the client to speak of the goal(s) to be achieved and then allow the therapist to generate the phrases and go over them with the client before the Twilight Learning sessions.

**The Man with No Life**

Perhaps the most satisfying case was NW, a 46-year-old single man who worked as a printer’s helper and lived in a boarding house. He had survived a brutal childhood on a Kansas farm where his father beat him and repeatedly told him he was no good and “wouldn’t amount to anything.” Close to monosyllabic, NW spent all his meager wages on therapy. He had tried seven years of psychoanalysis and four years of Scientology yet still felt terribly alone and unhappy. He had no friends and no hobbies.

NW came to us expressly for Twilight Learning after having read about the technique in an article about biofeedback in a local newspaper. The positive script was difficult to develop because NW had an extremely negative self-image. He strongly objected to the statement, “I am good,” because he said he was definitely not good. After approximately 10 minutes, NW announced that he could live with the statement, “I am adequate.” We finished the session with NW asking for the specifications for an appropriate script, because he wanted to do it at home and bring it to the
next session. He had been told by us that the right hemisphere of the brain was thought to be the seat of unconscious process and the right brain processed voice intonation contours such that an effective set of affirmations might be spoken with a good deal of intonation. Surprisingly he came back with a verse that he actually sang while accompanying himself on an old guitar, which he had not touched in 25 years. The verse was quite well done and incorporated most of the phrases we generated in the preceding session.

After six Twilight Learning sessions, NW said something happened at work. He had injured a finger because he was not attending to the job. He said he was thinking about finding a better job. After the ninth session, he felt he had experienced enough change to terminate therapy. A man of few words, NW gave us no clue as to progress other than, “He was feeling and thinking differently.” Six months later we called the printer’s shop (he gave us no home phone) and they told us he now worked at another print shop, and we then called there to reach him. Now NW was willing to talk some and told us that he had a better job, was living in his own apartment, and had joined a bowling and fishing group at work. We considered that a very successful outcome.

The case of NW illustrates the importance of allowing the client to play a major role in creating the affirmations, in fact, it may be very important for some clients to actually record the phrases on the tape in their own voices. We ask the client to choose which type of presentation he or she feels would be most effective.

**The Change Message: A Right-Brain Language**

As we refined the Twilight Learning procedure we were cognizant of the fact that the verbal comprehension capability of the right, or non-dominant, hemisphere was much less than that of the verbal left hemisphere. Consequently we studied the aphasic literature to learn what individuals with damaged left hemispheres could understand. We found that the intact right hemisphere had difficulty with negatives, especially double negatives. It also had trouble with abstract, low frequency (not frequently used in everyday speech) words. The right brain responds to nouns and action verbs, especially if the sentences or phrases are spoken with a great deal of voice intonation, rhythm, or emotion (Blumstein & Cooper, 1974; Zaidel, 1985). A useful technique for getting aphasic patients to understand is called Melodic Intonation Therapy or MIT. Thus, patients would be taught to “sing for their supper.” The right hemisphere is also specialized for handling “degraded” information such as subliminal presentations.

**Twilight Learning, Subliminal Process, and Alcohol Addiction**

As far as we know there has been only one dissertation (De-Haan Bearden, 1985, unpublished) that incorporated Twilight Learning (at least three other Twilight Learning dissertation proposals at different universities were not allowed because one or more committee members declared that it was brainwashing or mind control). While working with alcoholic clients at the Center for Alcohol Rehabilitation and Educational Services in Medford, Oregon, Rita De-Haan Bearden decided to combine Twilight Learning with subliminal process (or priming tapes as they might now be called) for her PhD dissertation for United States International University in San Diego (De-Haan Bearden, 1985). The subliminal audiotapes were of two themes: one contained left/right messages that focused on overcoming alcoholism, and the other contained primarily self-esteem enhancing suggestions. As prepared by Budzynski, the affirmations were placed approximately 15–20 dB below a mountain stream sound. When used with the Twilight Learning unit, the tapes would be “heard” only when the subject showed theta energy over (at least) the left hemisphere. The fascinating idea that addictions such as alcoholism are so deep-seated that change affirmations must be doubly-guarded from at least some critical screening defenses that extend down and are still operative in twilight sleep, must have occurred to Dr. De-Haan Bearden.

In addition to the two groups mentioned above there was a control group, which received the typical alcoholic treatment (as did the other two) but no Twilight Learning. Because the tapes were subliminal the study could be, and was, double blinded. De-Haan Bearden gave the two Twilight Learning groups three preliminary relaxation training sessions and then continued with five Twilight Learning sessions. Figure 3 shows the decrease in alcohol consumption in the three groups pre–post and in a 3-month follow-up. Greater increases in quality of life and adjustment to work were seen as well. Taken as a whole, the results showed a significant trend in the desired direction although no one measure alone reached significance. It is quite possible that with a larger number of training sessions the results could have reached significance.

**Green and Green’s Six Steps in Theta Programming**

For years Elmer and Alyce Green of the Menninger Biofeedback Laboratory disagreed with our Twilight Learning procedure in that we were presenting affirmations during a theta state. The Greens believed that one could attempt to skim off unconscious material
(“subliminal dredging” as Dr. Green referred to it) but should not attempt to input anything. However, in 1986, in a chapter in Wolman and Ullman’s *Handbook of States of Consciousness*, the Greens outlined a six-step theta programming technique for physiological and psychological change:

1. Move first into a state of EMG quietness and peripheral warmth.
2. While in this state, construct the visualization that is to be planted in the unconscious, a visualization that has already been carefully planned by the cortex, with ambiguities eliminated (for the unconscious is like a computer in some ways, and tends to take instructions literally).
3. Allow awareness to sink down into the theta state with the idea that the unconscious is now listening; it is now in “record mode.”
4. Gently project the visualization into the “field of mind” as a gestalt, with as little left-cortex activity as possible.
5. Terminate the session with a quiet command, such as “do it,” “so be it,” “the instruction is now terminated,” or the like, in order to terminate unconscious receptivity (similar to using the “enter” key in programming a computer).
6. Bring awareness back to the surroundings carefully so as not to disturb the planted instruction (pp. 575–576).

**Peniston and Kulkowsky Carry On**

We like to think that the procedure developed by Peniston and Kulkowski (1989) represents the most recent evolution of both the Twilight Learning and the Greens’ programming technique. These two researchers, working with inpatient alcoholic clients at a VA Hospital, applied their variation (essentially the six-step approach of the Greens) in a massed-practice, 36-session protocol. Later, they successfully applied their alpha-theta brainwave neurofeedback approach to Vietnam veterans with PTSD (Peniston & Kulkowski, 1991). Their success helped launch the modern era of EEG biofeedback, which has been labeled “neurofeedback” or “neurotherapy.”

**A Comparison of Twilight Learning and the Peniston Protocol**

Separated in time by 18 years, the two techniques have some common characteristics and some differences.

**Commonalities**

1. Both involve the absorption of positive content material while the client manifests primarily a theta or alpha/theta EEG pattern (a twilight state).

2. The Twilight Learning positive-change verbal affirmations are developed by the client and therapist together. In the Peniston Protocol, each of the change message image templates (as determined by Peniston) is personalized by the client, so that just as with the Twilight Learning scripting, the Peniston scenes are a creation of both the therapist, (using Peniston’s templates), and the client.

3. Both techniques assume that certain characteristics of the theta or alpha/theta EEG pattern allow a more effective absorption of the material.

4. The “bump” feature of Twilight Learning assures that at intervals the client will be boosted to a higher cortical arousal at which time the unconscious material that may have emerged can be integrated into the adult psyche, and the affirmative material can be stored in long-term memory (although perhaps on the unconscious level). In like fashion, the client using the Peniston Protocol typically moves up and down the cortical arousal continuum with some material emerging to be integrated and the imaged material stored in long-term memory, at least part of the time.

5. Both Twilight Learning and the Peniston Protocol assume a deeper, more lasting learning process than would be obtained with the material presented during the normal waking state.

6. This learning manifests more in the emotional and attitudinal realms than in the verbal realm. Behavioral changes are more automatic or unconsciously guided rather than consciously directed.

**Differences**

1. The material presented in the Twilight Learning procedure is of a tape-recorded or therapist-spoken verbal form, although associated visual imagery almost always develops spontaneously. The Peniston Protocol uses goal imagery as its rescripting medium.

2. The Twilight Learning technique can be used in an automatic mode, in which the presentation of the material is contingent upon the system detecting the presence of theta EEG. If theta is not present, the material is not presented. If the theta drops out, the verbal presentation is stopped also. The Twilight Learning system thus determines if the appropriate EEG pattern is manifest before the material is presented. In the case of the Peniston Protocol, the client is often unaware of whether the correct EEG pattern is present because of the lowered cortical arousal level and/or because he or she is trying to focus on the imagery.
3. Because the self-produced imagery in the Peniston Protocol is not automatically stopped and started, it is possible that a certain percentage of the time the client’s arousal level slips back up to full consciousness, with the result that the imagery acceptance may be blocked by the more conscious critical screening.

4. The Twilight Learning system incorporates a sleep guard (the “bump”), which prevents the client from falling asleep. It proportionally increases the audio volume as theta decreases in frequency and/or increases in amplitude. Typically, the volume increase bumps the cortical arousal up to alpha or beta, at which point the tape recorder is stopped. After a short interval, the client falls back into the theta state and the tape recorder is started again. This cycling back and forth across the alpha/theta border is characteristic of the Twilight Learning experience. Interestingly, this very characteristic is identical to what Rubin (1968) noted was the most efficient sleep-learning pattern found in a large number of Russian studies. The Peniston Protocol, as originally detailed, involved the therapist leaving the room as the client “entered theta” and attempted to take in the structured imagery with him. The client might easily fall asleep under these circumstances and remain there for the rest of the session.

5. The Peniston Protocol requires about 30 alpha/theta feedback sessions following the 6 sessions of hand temperature and imagery training. As originally conceived in 1970, the Twilight Learning incorporated 6 to 12 sessions and frontal EMG feedback was provided only if the client had relatively high facial tension. Earlier work in our biofeedback lab at the University of Colorado Medical Center had shown that individuals with low forehead EMG could transition easily into theta as they relaxed, whereas those with high EMG levels required preliminary frontal EMG biofeedback or they would not be able to produce theta (Sittenfeld, Budzynski, & Stoyva, 1976). Peniston’s work shows that perhaps 30 sessions of Twilight Learning training may result in a higher success rate than the 6 to 12 as we originally thought.

6. Finally, one technical point that might be important: We designed the Twilight Learning’s logic so that it would not allow the verbal presentation if alpha or beta energy was mixed with the theta. In other words, we wanted “pure” theta because we reasoned that “adulterated” theta allowed a certain amount of consciousness (and therefore, critical screening) to counter the affirmative material. The feedback units in the Peniston research probably allowed theta feedback (tone) even when the theta was mixed with higher frequencies. But, was this all bad?

It would appear that the occurrence of beta or alpha in the presence of primarily theta energy allows the conscious mind to play a role in the processing of the incoming material as well as any emergent feelings or images from the unconscious mind. Of course, with consciousness comes the critical screening, like the “little voice” mentioned above (e.g., “No, you’re not really like that,” or “It won’t last for long,” etc.). This can even reverse the effect of the suggestions. On the other hand, if extremely traumatic feelings and memories break through repressive bounds, the fact that there is some consciousness available to help integrate the material may help avert an uncomfortable abreaction.

But, There Is a Tradeoff
Peniston and Kulkowsky’s (1991) research with Vietnam veterans suffering from PTSD has demonstrated the need for some degree of beta consciousness, at least by the end of the session, to help soften the abreaction. The tradeoff is that if there is too high a level of consciousness during the session, the trauma material may never emerge to be integrated. It will therefore continue to cause trouble for the client. Modern neurotherapy techniques, however, can meter the degree of consciousness by means of the theta/beta ratio. An increasing ratio above a certain level indicates the possible breakthrough of such material. The neurofeedback computer can be set to sound an audio tone when the ratio goes too high. Access to unconscious material can then proceed without excessive abreaction. Note: Some therapists feel quite confident in working with abreactions and therefore welcome an increasing ratio.

The Twilight Learning Process Also Allows Access to Unconscious Material
If one of the goals in a particular session is to uncover unconscious trauma memories, the client is instructed to give a quiet verbal response of one or two words if any hypnagogic material is noticed. At the end of the session, the client can usually flesh out the imagery corresponding to the word cues. Given the set for uncovering dissociated material, the resulting hypnagogic imagery may be an actual memory or a highly disguised derivative of the memory. The hypnagogic imagery in the case of the “businessman who couldn’t say no” described above involved this sort of uncovering. During one of these early sessions he drifted into a “theta state.” Soon thereafter he softly whispered, “No!” During the debriefing afterward he was able to recall that the long, drawn-out negative was associated with the...
childhood memory when he had said “No” to his father and received a vicious slap across his face for so doing. He recalled that the slap not only stung and left his ear ringing, but caused him to feel embarrassed and shamed. It appeared obvious to the boy that his father hated him at that moment—hated him for saying “No.” It is not surprising that an early trauma of this sort could result in an inability to say no to authority figures throughout life.

**The Manager Whose Mind Blanked**

One of the most intriguing examples of fear of authority was a 52-year-old master machinist whose many patents caused him to be promoted to management status, whereupon his troubles began. His complaint was that during certain negotiations he would suddenly go blank and couldn’t think. With a set for recovering whatever images he could during a Twilight Learning session, he verbalized “beating” about 15 minutes into the session. We had already ascertained during the intake that he had grown up in Poland during the horrifying German occupation in World War II, so we suspected that the beating cue might be associated with those years. Although the post-session debrief revealed that the client could not immediately recall the trauma, a “tracking” of the Twilight Learning generated cue word allowed him to remember that something horrible had happened during the war. At this time he could only say that he lost his mother and father during the war and was reunited with his sister afterward. The sister had died recently in Europe. He believed his parents died in a concentration camp but he had a “blank” for the actual events preceding this.

In his next Twilight Learning session the set was to remember more details and that he would be able to handle whatever came up. Approximately five minutes into the primarily theta pattern he said quite distinctly, “They beat him—the Nazis beat him—in the basement.” The Twilight Learning session was terminated immediately as the client was quite agitated. He was then able to recall the entire memory of how the Gestapo came to their home and started to pummel his father. They knocked him down the basement stairs and continued to beat him in the basement. The boy, his sister, and mother were ordered to remain upstairs. With feelings of rage, helplessness, and shame the boy finally blanked out. He remembered that when he “came to,” his mother and sister were ministering to the dying father in the basement. The next day the Gestapo returned and took the mother. Once again the boy felt helpless. The children huddled together in terror for two days, when a neighbor told them they must flee, for the Gestapo were coming for them. As they ran down the street, the sister fell and was caught by the agents. The boy was snatched by a farmer who was driving his truck back to the farm. The farmer hid the boy through the war. He never found out why the Gestapo wanted his family.

As the client related the story, he unleashed a torrent of fist pounding emotion with tears and cursing. Finally he quieted and that session was ended. In the two subsequent sessions later that same week, we discussed the fact that in the face of such overwhelming odds he automatically entered a state in which his conscious mind escaped the horror. We also rescripted the event and the client saw himself heroically fighting the Gestapo agents in a valiant effort to defend his family. The satisfying result of the therapy was that the client no longer “blanked out” when negotiating with unreasoning authority figures.

**Twilight Learning, 2000**

What does the future hold for Twilight Learning? An important goal will be to enhance the incorporation of goal images into the twilight state. Perhaps this could be facilitated by conditioning an aroma to the goal scenes. Here is a procedure that will be explored in the near future:

1. The goal images are developed by the client and therapist.
2. The images are checked for appropriateness by client and therapist (i.e., the client “tries on” the image to see if it feels good in a variety of imagined situations).
3. The first scene is then imagined by the client and when clearly in mind, the client signals the therapist.
4. A fan is blowing across the client’s face as the scent is then brought close to the client’s nose. The aroma is held there until the client signals the scene fading or changing, at which point the scent is removed. The fan evacuates the aroma immediately. This is repeated at least five times so that the conditioning of the scent to the scene is strengthened.
5. It is hypothesized that during the “theta state” the presentation of the conditioned scent will facilitate the incorporation of the goal image. Thus, when the therapist sees that the client’s EEG is showing primarily theta rhythms, the scent is presented. It is removed if the client increases cortical arousal as signaled on the theta/alpha meter.

Certain scents, such as Johnson’s baby powder, Crayola crayons, etc., presented during the Twilight Learning theta states might also facilitate the recovery of early memories, especially since theta is the dominant frequency during the early childhood. **Note:** One could also think of these procedures as examples of state dependent learning.
Visual Imagery Incorporated into Twilight States Through Verbal Suggestion?

Another way that goal images may be able to be taken into the twilight state is simply by the use of suggestions on the Twilight Learning audiotape to visualize the goal image. This has never been explored in a systematic way and may be included in the aroma paradigm to act synergistically.

Subliminal Messaging in the Twilight Learning Audiotapes

Rita De-Haan Bearden’s dissertation indicated that in cases of alcohol addiction, subliminal messaging presented in a twilight state might affect positive changes in only six sessions. Recent careful research by reputable investigators (Swingle, 1992) lends new positive evidence that subliminal stimulation may affect food addiction, obsessive-compulsive disorder, and even systemic lupus erythematosus. Subliminal messages can be combined with supraliminal suggestions on the Twilight Learning tape. We hope to test the efficacy of this approach in the near future.

An Ideal Goal Programming State?

Some clinicians feel that the “Peniston-type” protocol works best if the client can be kept conscious, but deeply relaxed. For example, Wuttke encourages his patients to remain as alert as possible as they train through alpha and progress to theta (1992). If the state of “theta with awareness” is characterized by one’s being conscious of what is usually unconscious, and the detachment means that critical screening is “lowered,” we would agree that this would be the physiological end-goal of the technique. On the other hand, if the detachment is not secured, than the theta witness state could mean that the critical screening is intact, or if not, would instantly spring into place if emotional memories were tapped. In this case, the goal imaging may be no more effective than someone relaxing and visualizing the images with full consciousness.

The Twilight Learning system can be adjusted to allow varying degrees of “leakage,” by which is meant that some alpha energy can occur without turning off the theta message. It could also be adjusted to accommodate even some degree of beta energy, but this almost ensures that critical screening will pop up soon after emotionally toned memories arise, unless the client is trained in “detachment” beforehand.

Our early thinking about Twilight Learning and the brain postulated that each trauma experienced by an individual results in a change in the brain’s defensive structure. The more trauma, the more the defenses are hardened. Stronger defenses mean more rigid critical screening. The degree of critical screening would be inversely related to the acceptance of change messaging. Thus, those individuals who are most in need of a change in belief systems concerning themselves were the most resistant to suggestions for change. If this model is correct it would suggest that clients with less severe trauma histories could accept positive change messaging while in a more conscious state, whereas those unfortunate clients who experienced more severe trauma in their early lives would require a greater degree of lowering of cortical arousal (or critical screening) before the messaging would be accepted. Twilight Learning can require that all conscious screening be lowered (a “pure” theta state) before messaging is presented or, by changing the settings of the filters, the Twilight Learning can present the change messaging with some degree of alpha/beta consciousness. If the degree of defending could be determined before the Twilight Learning training then the filter adjustments could be made accordingly. Future research may incorporate such testing of defenses prior to Twilight Learning.

Twilight Learning as a Medium for Physical Healing?

Another area of Twilight Learning exploration will be its possibility as a technique for aiding in the healing of physical disorders, an example of which was the case described above of the overweight scientist with the low back pain. The question is: Do Twilight Learning suggestions and/or images have a more positive effect on the healing process than the same suggestions and/or images presented in the waking state? The ancient healers would no doubt argue for the former.

References


Twilight Learning Revisited


Thomas H. Budzynski