Instructions and EMG Feedback in Systematic Desensitization: A Case Report

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This case study describes the apparently successful treatment of an “examination phobia” with systematic desensitization. Video tape and verbal instructions were used as “advanced organizers” to prepare the patient for systematic desensitization. The patient was trained to relax with verbal instructions and electromyographic feedback training.

INSTRUCTIONS AND EMG FEEDBACK IN SYSTEMATIC DESENSITIZATION: A CASE REPORT

Bandura (1969) suggests that the effectiveness of reinforcement procedures may be enhanced by verbal instructions. The following case study appears to illustrate a clinical demonstration of the above hypothesis. The amount of time available for treatment of this patient was only 21 days and the amount of time the therapist could spend with her was limited to three sessions.

The patient, a 42-year-old white divorced female, the mother of seven children, reported an unhappy marriage for 22 years to a man she described as alcoholic. On welfare for many years, she had been compelled by the State to attend school for the previous four years to prepare for the General Education Development (GED) Examination, but was scared to take any examinations including those administered in school. The prospect of a public examination like the GED terrified her and she had previously withdrawn on three occasions from taking the test. She reported that, as an adolescent, she had dropped out of school in the 7th grade because of her fear of examinations. The patient’s current teachers reported that she was a bright student and stated that, if she could overcome her fears, they felt certain that she would pass the examination. I was contacted three weeks prior to the scheduled GED examination and requested to help in overcoming her “examination phobia.”

The patient was scheduled for an initial diagnostic interview and testing. She reported extreme fear of school or employment related tests and claimed that, before examinations, invariably she would have severe headaches, upset stomach, nausea, and feel weak and shaky. She had lost several employment opportunities because of her fears. We administered the Stanford Hypnotic Susceptibility Scale (SHSS) Form A to the patient to determine the extent to which her behavior could be controlled

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by verbal stimuli, and she was given a standardized set of simple written instructions for systematic desensitization, the technique itself and its rationale. She was told that she would have to do most of the treatment herself because of the proximity of the examination and the shortage of therapist time. Arrangements were also made for her to observe a standard video tape used to orient all patients to desensitization. The tape described and demonstrated the treatment components (relaxation training, hierarchy construction, and desensitization proper) and showed the movement of a real patient through relaxation training and desensitization with electromyographic feedback (Budzynski and Stoyva, 1969; Leaf and Gardner, 1971; Wickremasuriya, 1971b). The patient was told that only two more sessions were available with the present therapist, and that the second session would be used to respond to any questions which arose from reading the instruction sheet and viewing the video tape. The third session would be used to help her construct hierarchies and get her started with desensitization. The sessions with the present therapist varied between 60 to 90 min.

The patient's second visit to the clinic was scheduled for the next day. She met with the present therapist to discuss her reactions to the written instructions and the video tape on systematic desensitization. The use of the EMG feedback instrument was demonstrated to her and she started relaxation training with the EMG electrodes on the frontalis with a feedback tone proportional in frequency to the EMG level. In general electrical activity in this area is generated not only by the frontalis and corrugator muscles but also the eye, jaw, throat and tongue muscles. The patient is instructed to keep the tone as low as possible by relaxing, and as she approximates a low tone the loop gain of the feedback system is increased thus requiring her to reach a lower EMG level to hear a low tone. The response of relaxation is thus shaped through three adjustments in the sensitivity (low, medium and high) of the system. It is easy with auditory feedback to observe and demonstrate to the patient the consequences of relaxing these muscles.

The patient was next introduced to my assistant (a married female high school graduate, who volunteers 4 hr each day to the clinic) who supplements the EMG feedback training with three consecutive training sessions of verbal instructions in muscular relaxation (Wolpe and Lazarus, 1968). The training with verbal instructions precedes the EMG feedback training. The patient was also required to come to the clinic daily to practice for 30 min with the EMG feedback device, and to practice relaxation at home for 30 min daily. In a matter of fact manner she was told that the EMG unit enabled us to detect and record how much relaxation practice she was doing at home. She started her EMG feedback training on the low sensitivity level of the instrument and progressively worked up to the high sensitivity level. Her performance with feedback was monitored by my assistant at 5-min intervals. Her performance was recorded from the meter readout unit. When the patient was reporting subjective feelings of numbness and tingling in her body in the relaxed state and when she could also keep the EMG feedback at a low level on the high sensitivity setting, she was judged to be ready for desensitization. The verbal report

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2 Commercially available feedback system manufactured by Mr. J. Picchiotto, Box 1459, Boulder, CO 80302. Electrode placement and other procedures followed specifically the instructions described in the manual. Technical details as to sensitivity equivalents, feedback loop, resistance between electrodes, etc., may be found in the manual. The instrument if correctly used is constructed to eliminate the EEG, EKG, and “noise” artifacts.
of this and other patients' indicates that the ability to maintain a "blank mind" is associated with very low frontalis EMG levels.

My assistant then gave the patient several hierarchies of previous patients' with similar fears of examinations and asked her to use them to construct her own hierarchy. After the patient had completed the relaxation training and constructed her own hierarchy, which consisted of 20 cards on which the events leading up to and during the examination were briefly described in her own words, she was requested to memorize the contents of these notecards. During the desensitization proper the patient was connected to the EMG unit and it was set at the high sensitivity level. The meter unit was disconnected from the EMG console and an especially adapted recorder (Rustrack Model 288 FIA, with silently operating feature) was connected to the EMG unit. (Of course a recorder like the Rustrack can only record gross patterns of electrical activity.) The patient was told to terminate scene visualization whenever the feedback tone increased markedly and not to start visualization again until the feedback had declined notably. The therapist presented verbally the first three scenes to the patient and, because the recorder was tracking the EMG signal, we were able to observe the EMG events associated with the verbal presentation by the therapist of the first three aversive events from the patient's hierarchy.

The data appears to suggest that instructing the patient to start cognitive rehearsal of an aversive event in the relaxed state is associated with an increase in the EMG signal and that instructing the patient to terminate cognitive rehearsal of the event is associated with a decline in the EMG signal. It also appears, in general, that repeating the cognitive rehearsal is associated with less arousal on each presentation. Because of the exploratory and pilot nature of this study, it is difficult to be certain that the changes in the EMG data were exclusively a function of cognitive rehearsal, as impressionistically they appeared to be. Supposedly close conformity to the instructions in the EMG manual should reduce the probability of artifacts.

After the therapist had desensitized the patient to the first three scenes, he withdrew. The patient continued the desensitization, drawing on the scenes she had memorized from her hierarchy. Presumably, she used the auditory feedback to monitor changes in her level of relaxation and to determine when to "switch on and off"

Fig. 1. Mean frontalis EMG levels over ten sessions of relaxation training with auditory feedback.
the cognitive rehearsal of aversive events from her hierarchy. Hence, the last 17 scenes were desensitized by the patient in the clinic with auditory EMG feedback.

RESULTS

The patient reported that the examination came upon her while three scenes still remained to be desensitized, but apparently she had obtained sufficient benefit from the procedure to go ahead and take the examination and pass it with only mild feelings of anxiety. After the examination was completed she desensitized the last three scenes with EMG feedback. Soon afterward the patient had to take several civil service and employment examinations, which she approached with increasing confidence and on which she did exceptionally well. She reported that none of the previous unpleasant symptoms connected with examinations occurred.

DISCUSSION

Intuitively, it seems that verbal instructions currently provide the most economic, precise and elegant means of controlling complex human behavior. The identification of conditions and procedures (Wickramasekera, 1969, 1970a,b, 1971a,b) which will reliably increase the verbal stimulus control of behavior is a salient task. Suggestibility scales (e.g., Stanford Hypnotic Suggestibility Scale, Barber Suggestibility Scale) appear to provide a rough estimate of current or baseline responsivity to verbal stimuli under standard conditions. Our patient's score on the SHSS scale was 4, which indicates only a moderate degree of suggestibility or responsivity to verbal instructions. Barber's (1970) research indicates that relaxation instructions are one of the significant antecedent variables which increase suggestibility, and one of the effective functions of relaxation training in systematic desensitization may be regarded as a type of "setting event" (Kantor, 1959) that increases the subject's responsivity to verbal instructions (Wickramasekera, 1971b). The relaxed state may
reduce the “noise” or interference in the system (Nakamura and Broen, 1965) thereby increasing the impact of any new sensory–verbal input. A recent study (Chapman and Feather, 1971) supports our hypothesis (Wickramasekera, 1971b) that relaxation increases sensitivity and attention to phobic imagery. Hence, at least one important way in which muscular relaxation may contribute to systematic desensitization is through sharpening the patient’s focus of attention on the verbally presented conditioned stimuli (scene from hierarchy) and thereby increasing the probability that the conditioned response will be elicited. But the graded nature of the elicitation process maintains the arousal within tolerable limits, allowing extinction rather than the rare phenomenon of “resensitization” (Wickramasekera, 1970c) to occur. Clinically, it appears that, unless the conditioned response to the phobic stimulus can be elicited, it will be impossible to extinguish it in the consulting room. The conditioned response may, of course, be also elicited by “in vivo” procedures. Relaxation then appears to be a procedure that facilitates the effective manipulation of central events (cognition) and their autonomic concomitants, in a manner that it relatively independent of peripheral stimulation by real objects. Hence, one of the contributions of relaxation to systematic desensitization appears to be that it fairly reliably enhances the subjective reality of cognitive events and confers on them a measure of clarity and impact which is typically encountered only during “in vivo” stimulation.3

The above case illustrates how a combination of apparently effective procedures and strategies may facilitate the treatment of the motivated patient. Clinical experience appears to suggest that certain clear procedures were notable in her rehabilitation one, giving the patient responsibility appears to be an important strategy. This responsibility was conveyed behaviorally by limiting the therapist’s involvement, assigning specific tasks to the patient and setting or working with a deadline for the cut off of treatment (Goldstein, Heller and Sechrest, 1966). Showing (video tape) and telling (spoken and written instructions) the patient “how” she can participate in her own treatment enables her to translate her own motivation into a specific set of therapy relevant behaviors which both behaviorally define her commitment to intervene in her own life and which coincidentally also propels her treatment forward. The use of written instructions and video tape conceptualized as “advanced organizers” (Ausubel, 1963) for therapeutic learning has been previously suggested (Goldstein, Heller and Sechrest, 1966; Goldstein, 1971). The use

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3 What is required now is an experiment in which a phobic stimulus is presented verbally to the same patient in a “relaxed state” (as defined by verbal report and psychophysiological measures) and later in a nonrelaxed state. We predict that the same verbal stimulus will, in general, have greater subjective reality when the patient is in a “relaxed state.”
of informational feedback devices seem particularly relevant to work with
motivated subjects (O’Brien and Azrin, 1970). The use of video tape and
feedback instruments, etc., may provide for the potentiation of any latent
“placebo effects” inherent in a treatment situation. Finally, and perhaps
most importantly, the availability of the desensitization technique itself
gives a sense of coherence, direction and plausibility to the therapeutic
interventions.

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