

A TECHNIQUE FOR CONTROLLING BEHAVIOR IN NATURAL LIFE SETTINGS¹

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A behavior control technique is presented, consisting primarily of having a patient give up some portion of his reinforcers (usually money) with the understanding that he must behave in therapeutically prescribed ways in his natural environment to re-earn the reinforcers. The critical features and requirements of the technique are discussed, various applications are suggested, and implications for research are drawn.

A behavior modification program is likely to be successful to the degree to which it provides control over the relevant response-reinforcement contingencies. That human behavior may be readily modified under conditions which permit precise control of reinforcement variables, as in the laboratory, the clinic, or the institution, has been abundantly demonstrated. Yet, in the usual form of out-patient behavior therapy the therapist has little if any control over the major reinforcements and punishments for the patient's behavior. Direct contact with the patient is typically intermittent and brief, and when it does occur, the therapist's attempts to change behavior often consist of verbal persuasion rather than the direct manipulation of reinforcement. During much of therapy, furthermore, the patient usually remains in his natural environment and is thus continually exposed to the reinforcement contingencies which presumably maintain his behavior problem. Under such conditions it may be difficult, if not impossible, to modify the subject's behavior. Even if adequate control is achieved over the relevant variables through some form of institutionalized therapy, the ultimate goal of the treatment remains the modification of the individual's behavior in his normal environment. To the degree that the natural and institutional environments differ, the salutary institutional

effects can be expected to dissipate to that extent when the patient returns to his natural environment. An urgent problem for the behavior modifier, then, is the development of techniques to extend his control over the patient's behavior in everyday situations and allow him to shape appropriate behavior in the presence of the ultimate controlling stimuli. This paper outlines such a technique and considers the major issues in its application and development.

The central features of the technique are that as a condition of treatment the patient must surrender some portion of his reinforcers to the therapist, with the understanding that he must then re-earn them by behaving in a specified manner within his usual environment. In this way, the subject must function in his normal environment under a sustained threat of an aversive consequence for failure to emit the desired behavior or for emitting prohibited behaviors; at the same time, alternative, therapeutically preferred behaviors are reinforced (with his own reinforcers). This technique was originally conceived as a means of breaking the cigarette-smoking habit (Elliott and Tighe, 1968), and reference to its application to this problem will serve to illustrate the manner in which it might be applied to behavior modification programs in general. Each participant in the program to stop smoking gave \$65 to a pool and incurred immediate loss of the money if he used tobacco in any form during the course of the next four months. But successive periods of abstinence during the treatment were immediately reinforced by returning some portion of the money. Thus, if the participant did not smoke for two days, \$10 was returned to him. If he

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abstained for two weeks, another \$10 was returned, and so forth, with the final installment of his money concluding the program. By posting money in an amount large enough to make its loss painful, the participant added to the distant and somewhat vague threat to his health, an immediate, clearly defined, and persisting aversive consequence of smoking. In addition, he was made to practice continually the behavior he sought to acquire (in this case, not smoking) in the presence of a broad sample of the cues which prevail in his natural environment. Although application of this technique to the problem of smoking was of a preliminary nature, the results were quite encouraging. Of 25 habitual smokers who participated in either a three- or four-month program, 21 remained abstinent throughout the treatment period. A long-term follow-up found approximately 40% of the participants still abstinent. Both these results compare very favorably with the outcomes of traditional techniques.

This technique of implementing reinforcement principles in natural life settings is potentially usable to modify many out-patient behavior problems. It appears to be clearly applicable to behavior disturbances where excess behavior, as in the addictions, is the problem. For example, in the treatment of excessive eating an agreement might be made between therapist and patient that specified amounts of weight loss will be reinforced by the return of portions of a posted reinforcer. Similarly, it should be possible to treat in this manner a large variety of socially undesirable excess behaviors that can be readily monitored, *e.g.*, fighting, cursing, tardiness, bullying, being messy, *etc.* In the case of treating persons with behavior deficit—the phobic, the frigid and impotent, the shy, *etc.*—the technique might be especially useful in the early stages of treatment as a means of inducing first approximations to the desired behavior. (Presumably, in the later stages of learning to overcome a behavior deficit, performance of the new behavior itself should ordinarily be sufficient reinforcement.) Although we have illustrated the procedure with money as a reinforcer, it should, of course, be possible to employ any of a large variety of reinforcers which can be readily exchanged. For example, one of the subjects in the smoking study surrendered 25 of his favorite records to the experimenter un-

der the agreement that he would earn these back in installments for good behavior.

Regardless of the particular behavior problem or reinforcer involved, particular care must be exercised to meet three conditions involved in applying the technique. First, the response-reinforcement relation should be set up so that it is irrevocable and the patient should be convinced that the manipulated behavioral consequences are inevitable. For example, in the smoking program (Elliott and Tighe, 1968) each participant was required to surrender his money in cash and to signify in writing his agreement to forfeit the money if he smoked. The use of checks or promises was not permitted because they might be stopped or broken. Only if the response-reinforcement relation is one which the patient cannot revoke or suspend is it likely to be an effective controller of his behavior when he is confronted by the powerful influence of the discriminative stimuli for inappropriate behavior (temptation) within his usual environment. It is this aspect of the technique which distinguishes it from such procedures as manipulation of therapist's fees during conventional therapy (Stevenson, 1962). Fee manipulation is apt to be a less effective form of control in that the patient may simply terminate treatment, and in this way remove the response-reinforcement contingency.

A second condition of effectiveness is that the program should be sufficiently extensive to make probable the persistence of the improved behavior after the threat of reinforcer loss has terminated. At present, the therapist must largely be guided by his knowledge of the behavior involved in meeting this condition. One procedure that may be useful in this regard is to urge the subject to extend treatment if he does not feel confident of his ability to continue the improved behavior when treatment ends. This procedure was tried with some of our smoking subjects and several of them extended the behavior-reinforcement contract for various periods up to 1 yr of total treatment length.

Third, the therapist must be assured that the desired behavior is actually occurring during the course of the treatment. The ease with which this condition can be met will vary widely with the nature of the behavior problem. On the one hand, there are a number of out-patient behavior problems which are nota-

ble for their aversive or attention-getting effect upon others (e.g., unreliability in work situations, temper tantrums, moodiness, tardiness, excessive shyness), and it therefore should not ordinarily be difficult to secure adequate witness to the occurrence or nonoccurrence of such behaviors. On the other hand, it is obvious that there are many behavior problems that are not so amenable to observation. For example, adequate monitoring of drinking behavior would be an extremely expensive and time-consuming procedure and would require virtually complete invasion of the patient's privacy. In such cases the therapist may be forced to use the subject's verbal report, but since the subject's own reinforcer is at stake, such reports should be substantiated through supplementary measures. The problem of validating patients' reports of progress has received relatively little attention from behavior scientists, but there are a few procedures which might be recommended as having some general applicability. First, the patient may be asked to agree to a system of random and unannounced checks on his behavior by individuals who are normally in contact with him in his natural environment. Powell and Azrin (1968) used a system of this nature to check their subjects' abstinence from smoking in their normal work environment. Second, the nature of the patient's commitment might be made public, both as a means of promoting widespread surveillance of the target behavior and as a means of increasing the risks to the patient for engaging in the prohibited behavior and making false reports. For example, in the smoking study, the participant's money was returned on the basis of his verbal report of abstinence. But our confidence in the veracity of the subjects' reports was increased by the requirement that they allow publication of their names, in the newspaper of the relatively closed community in which we all lived, as participants in a program which required them not to smoke for 16 weeks or to forfeit money if they did so. An alternative means of publicly identifying participants in a behavior modification program would be to require them to wear badges and then make periodic checks to insure that the badges are displayed throughout the treatment period. Third, Powell and Azrin (1968) devised an ingenious system which is potentially applicable to any case in which the therapist

wishes to monitor the patient's use of a prohibited consumable reinforcer. They required their subjects to carry a cigarette box which, whenever opened, delivered an intense shock, activated a counter, and elevated a rod which was easily visible to an observer. The subject was instructed to reset the rod manually each time he finished a cigarette. Then, periodic inspection of the counter and the subject's smoking behavior in relation to the rod position enabled the observer to infer whether the subject was securing cigarettes from the container rather than another source and, if so, how many. Fourth, for at least some types of behavior disturbance, the therapist might arrange periodic or terminal tests of the behavior at issue. For example, Bandura, Grusec, and Menlove (1967) checked the post-treatment fear of dogs of formerly phobic children by observing the children approach and fondle a dog; and Paul (1966) and Grossberg (1965) checked fear of public speaking by observing the post-treatment public speaking behavior of their subjects. Finally, it should be possible to develop standardized interviews designed to check the subject's veracity. Such interviews might include tests for verbal contradictions or claims of excessive accomplishments, as in the procedures employed by test constructors to check the subject's honesty.

In regard to the further development and refinement of the technique, there are a number of issues which appear to merit experimental analysis. First, it seems likely that the schedule of reinforcement return may be a significant factor in the effectiveness of the technique, and that different schedules may be found appropriate for different behavior problems. For example, in applying the technique to smoking behavior, this condition was manipulated as a shaping procedure. We sought to make sustained abstinence more probable by first requiring and immediately reinforcing a period of abstinence which was probably within the capacity of each beginning participant, *i.e.*, an initial two-day period of abstinence followed by return of \$10. The later payoffs were then staggered over successively longer periods of abstinence in an effort to approximate gradually the ultimate demands of long-term quitting. Finally, by having the participant complete the program under a gradually reduced threat of loss (during the final week of the program smok-

ing incurred a loss of only \$20), we hoped to increase the similarity between treatment and post-treatment conditions and thereby facilitate transfer of abstinent behavior to the latter situation. It would be useful to verify experimentally the postulated contribution of such manipulation of payoff schedule and to have data on the effects of other basic variations in the schedule of reinforcement return as well, *e.g.*, payoff of improved behavior on a variable-interval or a variable-ratio basis.

Another matter which merits experimental assessment is the role of the unique reinforcement contingency imposed by the technique, *i.e.*, the presentation or loss of a reinforcer previously owned by the subject and surrendered as a condition of treatment. On an intuitive basis, the prospective loss of a previously owned reinforcer seems to be an unusually compelling form of behavior control, and this notion was expressed by a number of the subjects in the smoking study. It would be interesting, then, to compare this form of reinforcement with that of direct payment (in an equivalent amount) for behavioral improvement. A not inconsequential aspect of this issue is that the use of the subject's own reinforcer, should this prove to be a generally effective form of control, avoids the practical limitations involved in direct payment by the therapist for altered behavior, as in manipulation of therapist's fees.

It would also be interesting to compare individual *versus* group administration of the technique to determine if the social reinforce-

ment inherent in the latter condition significantly enhances effectiveness of the treatment. Various means of disposing of forfeited reinforcers might also be investigated. In the smoking study, participants agreed that forfeited money would be divided among those who remained abstinent, a procedure which brings into play the incentive of possible gain. But another possibility would be to have participants agree upon an impersonal beneficiary, such as a research program. Finally, it would be useful to have data on the effectiveness of the technique with and without conventional conversational therapy or other forms of adjunctive treatment, *e.g.*, shock aversion.

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