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# STIMULUS CONTROL TREATMENT FOR INSOMNIA

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The purpose of the present paper is to describe a treatment derived from an operant analysis of sleep and insomnia. In this analysis, falling asleep is conceptualized as an instrumental act or operant which is emitted to produce reinforcement (i.e., sleep; see Murray, 1965, for the literature relevant to the reinforcement value of sleep). Thus, stimuli associated with sleep become discriminative stimuli for the occurrence of reinforcement. Difficulty in falling asleep, then, may be due to inadequate stimulus control. Strong discriminative stimuli for sleep may not have been established and/or discriminative stimuli for activities incompatible with sleep may be present.

Stimulus control treatments have been effectively employed to alter a variety of problems such as studying (Fox, 1962; Goldiamond, 1965), overeating (Ferster, Nurnberger, & Levitt, 1962; Stuart, 1967), and marital difficulties (Goldiamond, 1965). To achieve stimulus control, the environment is structured so that the target response occurs contingent upon the presence of particular stimuli; and competing responses are not allowed to occur in their presence. For example, to increase studying, Goldiamond (1965) had *S* bring studying under the stimulus control of her desk. If *S* wished to write a letter, read comic books, or daydream, she was required to do those activities some place, other than her desk; "at her desk she was to engage in her school work and her school work only."

A stimulus control treatment may have considerable potential for difficulty in falling asleep since such difficulty might be caused by bedtime* becoming a stimulus for activities incompatible with sleeping. The treatment would require the separation of the stimuli associated with sleep from those associated with other activities. If a person wished to watch TV or to worry, he would have to do those activities someplace other than the bedroom at bedtime*.

The following case study is presented as a preliminary attempt at applying stimulus control instructions for the treatment of chronic insomnia.

## METHOD

### *Subject*

The *S* was a 25-yr.-old married male who reported that he had had difficulty falling asleep for the previous 4 or 5 yr. His sleep pattern prior to treatment was to try to fall asleep at about midnight but to be unable to sleep until 3 a.m. and sometimes 4 o'clock in the morning. Between midnight and 4 a.m., *S* would worry about money, bills, his job, etc., and finally turn on television to avoid worrying. Often he would fall asleep with the television still going.

The S's wife brought the problem to the attention of the author while she was enrolled in an undergraduate course with him.

### *Treatment*

The goal of the treatment was to bring sleeping under the stimulus control of S's bed and bedroom. To accomplish this, his wife relayed the following instructions:

1. Lie down intending to go to sleep only when you are sleepy.
2. Do not read or watch television in the bedroom.
3. If you find yourself unable to fall asleep,[1] get up and go into another room. Stay up as long as you wish and then return to the bedroom to sleep.
4. If you still cannot fall asleep, repeat Step 3. Do this as often as is necessary throughout the night.

The above rules were to form the basis for the development of permanent sleeping habits. Thus, the same rules were to be observed even after success was achieved.[2]

## RESULTS AND DISCUSSION

The results as seen in Fig. 1 are very clear. The treatment was successful in dramatically altering S's reported insomnia within 2 wk. At the beginning of treatment *S* had to get out of bed and leave the room 4 or 5 times a night. At the end of 2 wk. about half of the nights passed without his having to get up at all; and by the end of the follow-up period he had minor difficulty (getting up once during the night) less than once a week. The *S* also reported that he was sleeping much better, getting from 2 to 4 hr. more sleep per night than he had been getting before treatment. This marked improvement was confirmed by his wife. Thus, the results of three measures (number of risings, S's self-report, and wife's report) converge.

Although the treatment was very effective, its effectiveness may have been due to factors other than stimulus control. In a case study such as this there are many alternative hypotheses which should be evaluated in

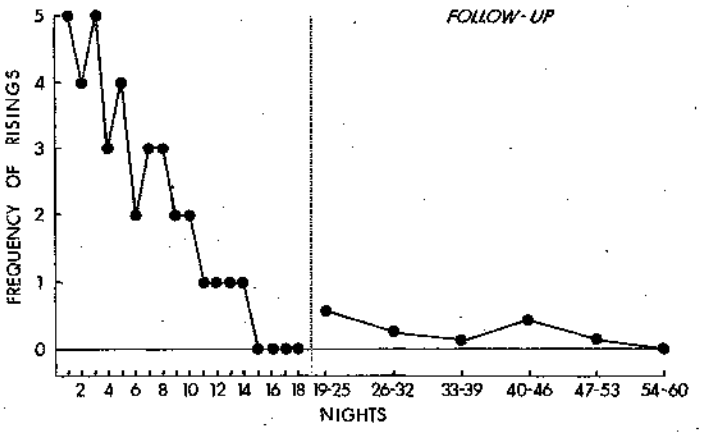


**Fig. 1. Frequency of nightly risings during treatment and follow-up.**

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* Although this instruction is vague, it was felt that any attempt to be more specific would have produced clock-watching and thus exacerbate the problem of failing asleep.

[2] No restrictions were made on the time and place for sexual activity. On such occasions, the instructions were followed afterwards, when *S* intended to go to sleep.

subsequent research. For example, getting out of bed may have been aversive and thus may have served to punish continued wakefulness. This rather than stimulus control may have been the effective component of the treatment. Other factors to be considered include nonspecific therapy effects as well as the role S's wife played. Her continuing interest undoubtedly helped motivate *S* to keep to the instructions. Parenthetically this suggests that not only may it be more economical to train family members as therapeutic agents, but it may also be therapeutically more effective.

A major methodological problem for studies of insomnia is the measurement of sleep. An effective treatment is one which decreases the amount of time to fail asleep when the patient is *at home in his own bed.* Most reliable measures of onset of sleep are both reactive (Webb, Campbell, Schwartz, & Sechrest, 1966) and impractical outside of a sleep laboratory. Although it might be possible to take EEG readings in S's home, wearing electrodes could easily alter S's behavior and bias the measures. Because of this, studies investigating behavioral treatments for insomnia (e.g., Evans & Bond, 1969; Kahn, Baker, & Weiss, 1968) have relied on 5"s self-report. However, such reports are vulnerable to both intentional and unintentional sources of bias. The *S* who wants to please his therapist may alter his reports; or he may believe that he is sleeping more when other convergent measures would indicate otherwise.

Nevertheless, S's report is an important measure. It was his verbal complaint of insomnia which initiated treatment, so his verbal statements of improvement should not be dismissed lightly. In addition, not all verbal reports are susceptible to the same degree of bias. Since most *Ss* under most circumstances try to cooperate with requests for accuracy of reporting (Weber & Cook, 1972), and thus are not likely to intentionally deceive $E_9$ biased reporting can be reduced by making S's task more specific and less ambiguous. Therefore, daily logs (such as the number of risings) are likely to be less biased than global reports of improvement. In addition, reports of household members (such as spouses) can provide an independent and convergent measure of improvement.

Although future studies will be necessary to specify the factors involved in the treatment's success, the results reported here are encouraging for a number of reasons. First, the treatment was dramatically successful. In addition, it was simple to administer and progress could be assessed within a few days after treatment was initiated. Finally, and perhaps most importantly, this demonstration confirms the heuristic value of learning theory principles. The treatment was derived from such a principle, applied to a new area, and found to be successful.

## REFERENCES


Evans, D. R., & Bond, I. K. Reciprocal inhibition therapy and classical conditioning in the treatment of insomnia. *Behaviour Research and Therapy,* 1969, **7**, 323-325.

Ferster, C. B., Nurnberger, J. I., & Levitt, E. B. The control of eating. *Journal of Mathetics,* 1962, **1**, 87-110.

Fox, L. Effecting the use of efficient study habits. *Journal of Mathetics,* 1962, **1**, 75-86.

Goldiamond, I. Self-control procedures in personal behavior problems. *Psychological Reports,* 1965, **17**, 851-868.

Kahn, M., Baker, B. L., & Weiss, J. M. Treatment of insomnia by relaxation training. *Journal of Abnormal Psychology,* 1968, **73**, 556-558.

Murray, E. J. *Sleep, dreams, and arousal.* New York: Appleton-Century-Crofts, 1965.

Stuart, R. B. Behavioral control of overeating. *Behaviour Research and Therapy,* 1967, **5**, 357-365.

Webb, E. J., Campbell, D. T., Schwartz, R. D., & Sechrest, L. *Unobtrusive measures: Nonreactive research in the social sciences.* Chicago: Rand McNally, 1966.

Weber, S. J., & Cook, T. D. Subject effects in laboratory research: An examination of subject roles, demand characteristics, and valid inference. *Psychological Bulletin,* 1972, **77**, 273-295.