RESTRICTED ENVIRONMENTAL STIMULATION THERAPY OF SMOKING: A PARAMETRIC STUDY

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Abstract — Restricted environmental stimulation therapy (REST) has been shown in several studies to be an effective technique in smoking intervention. The most common procedure has been 24 hours in a dark, silent chamber; in several cases, messages designed to facilitate smoking cessation have been presented every few hours over an intercom. This study parametrically varied 12 versus 24 hour chamber REST sessions and four message presentation schedules (massed, distributed, or self-demand presentation of five messages, and a no message condition). A ninth group of volunteer subjects spent five one hour sessions in a flotation REST tank. In this condition, no message was presented during the first session; one message was given during each of the next three sessions; and two messages were given in the last session. Previous findings of therapeutic efficacy were confirmed for chamber REST, with 3- and 12-month follow-ups showing means of 51% and 35% reduction, and 34% and 21% abstinence, respectively. The 24-hour distributed message group, representing the modal technique, showed a mean reduction rate of 51% and an abstinence rate of 36% one year after treatment. There were no significant differences as a function of the two main factors nor the interaction. Most chamber REST groups showed significant smoking reductions on both follow-ups. Flotation REST led to a significant decrease three months after the treatment, but not at one year. The data have theoretical as well as practical implications for future uses of REST.

Restricted Environmental Stimulation Therapy (REST), the reduction of environmental input — sometimes combined with messages and/or traditional interventions — can reduce smoking rate 6-12 months after one session by 30% to 70%, with abstinence rates of up to 87% at six months and 53% at one year (Barabasz, Baer, Sheehan, & Barabasz, in press; Best & Suedfeld, 1982; Deaton, 1983; Tikalsky, 1984). Although such findings have been firmly established and replicated (Suedfeld & Kristeller, 1982), a number of issues remain to be settled.

REST is not only a powerful, but also a cost-effective, intervention (see, e.g., Borrie, 1980). This study was primarily designed to test whether procedural variations in REST type, session duration or message presentation schedule could increase the success rate and/or reduce financial and temporal costs even further. Theoretical considerations were also relevant. It has been argued that the therapeutic impact of REST depends partly on stimulus need, which leads subjects to attend more closely to messages, respond to them in a more accepting and positive fashion, and remember them better (Suedfeld, 1980). However, while 24 hours of REST does lead to improvements in rote memory, neither the relationship of this effect to habit change nor the other components of the stimulus-need hypothesis have been con-
firmed. A self-demand message presentation group, presumably maximizing motivational level and message impact, would provide relevant data. Another question with both pragmatic and theoretical implications is whether the effects of flotation REST on habit modification are equivalent to those of chamber REST (Suedfeld & Ballard, 1984).

**M E T H O D**

**Subjects**

Subjects from our waiting list include volunteers of both sexes, ages 19 to 70, who have smoked at least one pack of cigarettes per day for at least five years. Eighty-six such subjects were in this study. Because of the long follow-up period and problems in reaching subjects, 18 replacement subjects were run later, N = 83 (9-11 per group), plus six subjects in tank REST.

**Procedure**

The chamber-REST part of the study followed a 2 x 4 design: session duration (12 versus 24 hours) x message presentation schedule (see below). Flotation constituted a separate treatment group.

At the first session, subjects were familiarized with the relevant REST environment and procedures. They were shown how to contact the monitor who would be in the next room at all times, and how to let themselves out of the chamber or tank if they wanted to terminate the session early. Any questions were answered. Each client signed the consent form and provided information about smoking and other health-related habits, medical conditions, etc. They were given booklets on which to monitor their smoking for a week before their treatment session (first session for flotation REST).

The REST chamber is completely dark and sound-reducing. A chemical toilet, water, and liquid diet food are available ad lib. The flotation tank is in a dark, quiet room. The 34 °C water is 25 cm deep, with 360 kg of dissolved Epsom salts; the ventral surface of the body is above the water.

Exhaled carbon monoxide was measured to increase the accuracy of self-reported smoking (Ohlin, Lundh, & Westling, 1976). Because our CO ecolyzer was only roughly accurate, and to avoid reactive effects, these readings were neither reported back to the client nor used in data analysis.

Follow-ups were conducted by mail and phone monthly for one year. Up to five CO measurements were scheduled; however, because of equipment problems and serious inconvenience to clients, many of these were omitted (cf. King, Scott, & Prue, 1983).

**Messages**

The five messages had been reported as helpful in previous studies (e.g., Suedfeld & Ikard, 1974; Best & Suedfeld, 1982). One each emphasized the importance of protecting one's body from poisons such as cigarettes (Spiegel, 1970); taught a deep-breathing relaxation exercise to use when craving a cigarette; described imaginary situations using the relaxation exercise to deal with emotions; prepared the client for a possible relapse; and congratulated the client on becoming a nonsmoker.

Presentation schedules were as follows. *Distributed*: one message one hour after the session began, the last within 45 minutes of the end, others at irregular intervals. *Massed*: two messages within the first hour, two around the midpoint, and one 45
minutes before the end. Self-demand: after the first hour, whenever the subject pressed a button. Flotation: a one-hour familiarization float, no message; then one message around the midpoint of each of four subsequent one-hour floats; last message just before the end of the last, all within 14 days.

**RESULTS**

Table 1 shows the 3- and 12-month follow-up data. Mean reduction across all groups was 51% at three months and 35% at 12; there were no significant differences as a function of session duration or message presentation schedule. Most treatments did result in significant reduction at both follow-ups. The two message conditions that were the most powerful using 24 hour of REST (distributed and no messages) had only nonsignificant effects in 12 hours. The 24-hour distributed message group had the highest rates of both reduction and abstinence. Flotation led to mean 13% and 18% reductions at 3 and 12 months respectively, with no subjects abstinent.

**DISCUSSION**

The results again showed the usefulness of chamber REST in smoking intervention. Parametric variation did not identify an optimal combination; apparently, the REST effect is not altered by minor changes in procedure. The stimulus-need account of REST effectiveness was not supported: self-demand presentation was no more successful than other schedules.

A 24-hour REST session, although not 12 hour, may be just as effective without messages (Suedfeld & Ikard, 1974; Suedfeld, Landon, Pargament, & Epstein, 1972). However, messages do make a difference in REST treatment for weight reduction (Borrie & Suedfeld, 1980) and reduction of alcohol intake (Adams, Cooper, & Scott, 1982).

It is clear that flotation is not necessarily equivalent to chamber REST. It has reliable positive results on relaxation (Jacobs, Heilbronner, & Stanley, 1984; Suedfeld, Ballard, & Murphy, 1983; Turner & Fine, 1982) and pilot studies have shown its benefits in treating stress-related problems (Fine & Turner, 1982; Jacobs, Kemp,
Keane, & Belden. 1983). Suedfeld and Ballard (1984) have argued that chamber REST is primarily useful in changing attitudes and volitional behaviors, while flotation treats nonvolitional psychophysiological disorders. This is compatible with criticisms of induced relaxation as a treatment for substance abuse (Klajner, Hartman, & Sobell, 1984; see also Forgays & Belinson, 1984; Forgays, personal communication, February 12, 1985; Jacobs, personal communication, December 11, 1984).

Chamber REST has moved beyond the status of an experimental intervention for smoking. It is a robust and replicated procedure, which can be combined with more traditional treatments at little additional cost. Its use in other contexts, and the effective applications of flotation REST, warrant further investigation.

REFERENCES


Tikalsky, F.D. (1984, September). REST, contingency management and social support applied to the termination of smoking behavior. In P. Suedfeld (Chair), *The effectiveness of reduced stimulation in smoking cessation programs*. Symposium conducted at the International Congress of Psychology, Acapulco.