

**RAPID SMOKING AND SELF-MANAGEMENT TRAINING:
A CONTROLLED COMPARISON OF RELATIVE
EFFICACY IN THE TREATMENT OF DEPENDENT
CIGARETTE SMOKERS**

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RAPID SMOKING AND SELF-MANAGEMENT TRAINING:
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EFFICACY IN THE TREATMENT OF
DEPENDENT CIGARETTE SMOKERS

by



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ABSTRACT

The relative efficacy of rapid smoking and self-management procedures employed alone and in combination were compared with an attention-control condition in a program to reduce cigarette smoking. Thirty-three smokers were randomly assigned to one of the four treatment groups and attended eight treatment sessions over a 5-week period. There were no differences between treatments in the proportion who stopped smoking or the mean reduction in smoking at the end of treatment and at 1-year follow-up. The overall proportion who stopped smoking was 44% at the end of treatment and 26% at 1-year follow-up. These results, contrary to prediction, fail to support the superiority of the behavioral techniques over simple support. It is suggested that greater attention be paid to the potential efficacy of social support in future research on the modification of smoking behavior.

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INTRODUCTION

Recent surveys of the smoking behavior of North Americans have provided an abundance of data from which a number of interesting trends have emerged (Health & Welfare Canada, 1981; U.S. Public Health Service, 1977, 1979, 1981). Unfortunately, while there is some basis for optimism, the news is still not good. Public awareness of the health risks associated with smoking has increased considerably and has led to changes in attitudes and smoking practices. Increased risk awareness does not seem to be sufficient, however, to produce widespread smoking cessation.

Over the past 15 years, the vast public health education campaign against cigarettes has altered the sociological or cultural view of smoking (Leventhal & Cleary, 1980). There has been a noticeable increase in activism among nonsmokers which has helped foster increased pressure on smokers to quit, as well as a new focus on nonsmokers' rights. Within this social context, a pattern of steady decline in the proportion of smokers at almost all age levels has been noted (Health & Welfare Canada, 1981; U.S. Public Health Service, 1979). Moreover, Warner (1977) has estimated that the antismoking campaign has contributed to a leveling off of the escalating smoking consumption pattern, and seems to have prompted many smokers to switch to cigarettes with low tar-nicotine content (Gori,

1976; U.S. Public Health Service, 1979; Russell, 1974).

Also, business and industry are showing increased interest in workplace antismoking programs for primarily economic reasons (Orleans & Shipley, 1982).

Given the cumulative effects of the varied public health education initiatives it is not surprising that a U.S. Public Health Service (1977) Survey found that 90% of respondents had tried or wanted to give up smoking completely. What is disappointing is that among those who tried to quit less than 10% were abstinent for a minimum of 3 months. Although, as has been suggested, "controlled smoking" may be a more realistic goal for some than total abstinence (Best & Bloch, 1979; Frederiksen & Peterson, 1976; Frederikson & Simon, 1979), the fact remains that the majority of smokers are unable to quit despite repeated efforts. Further, anyone concerned with the development of techniques to aid in smoking cessation is struck by the instability of treatment outcomes. Major reviews of the literature on the modification of smoking behavior have somberly noted the tendency of impressive short-term success rates to dissolve into long-term relapses (Bernstein, 1969; Bernstein & Glasgow, 1979; Bernstein & McAlister, 1976; Hunt & Belpalec, 1974; Hunt & Matarazzo, 1973; Leventhal & Cleary, 1980; Lichtenstein & Danaher, 1976; Pechacek & Danaher, 1979; Raw, 1978). Hunt, Barnett and Branch (1971), in a classic study comparing treated heroin addicts, alcoholics and smokers, found relapse curves to be very similar across

addictions. In all three conditions, roughly 65% of successfully treated subjects relapse within 3 months of the end of treatment, and within 1 year 80% of all subjects are recidivists. Obviously, in the treatment of addictions, the prevention of relapse is as important as the initial success of therapy.

When comparing and contrasting methods of smoking modification, one is faced with an almost endless series of techniques and procedural variations. The methods currently available range widely from gimmicks and pharmacological cessation aids to hypnosis and behavior modification programs. Despite isolated successes, most of these techniques have not resulted in high rates of behavior change. Nevertheless, the demand for effective, low cost treatment programs is increasing along with changes in social norms regarding smoking. Although most smokers who are motivated to quit report being interested in do-it-yourself procedures, an estimated 20 to 30% would consider a formalized treatment program (Best & Bloch, 1979; Kanzler, Zeidenberg, & Jaffe, 1976; McAlister, 1975; U.S. Public Health Service, 1977). As the credibility and perceived efficacy of diverse treatment strategies is known to affect smokers' treatment choice (Hynd, Stratton, & Severson, 1978), the utilization of formal programs would probably increase as treatment techniques become more effective.

Thus, in an attempt to meet this need, clinicians and investigators must sort through smoking control

literature which is, as Frederiksen and Simon (1979) so aptly put it, a mile wide but only an inch deep. From the plethora of smoking control studies carried out over the past 15 years, very little useful data has emerged (Berglund, Bernstein, Eisinger, Hochbaum, Lichtenstein, Schwartz, & Straits, 1974; Bernstein & McAlister, 1976; Lichtenstein & Danaher, 1976). However, the increased rigor of some of the more recent research, especially in the behavioral area, has begun to produce some tentative suggestions regarding effective treatment strategies. The most effective approaches tend to be multidimensional, individualized and based on a sound rationale (Pechacek & Danaher, 1979). Also, it is abundantly clear that smoking modification programs must include procedures for both the initiation and maintenance of change. It seems likely that these two processes are relatively independent (Bandura, 1977; Best & Bloch, 1979; DiClemente, 1981; Marlatt & Gordon, 1980).

The focus in this section will be an appraisal of the major trends in smoking modification technology, with particular attention to behavioral research. The basic approaches to intervention will be described and, where possible, these will be related to theories of addictive behavior. Emphasis will be on the process of smoking cessation within formal programs. The phenomenon of unaided cessation is largely unexplored and much of the available

data are retrospective and subjective (Baer, Foreyt, & Wright, 1977; DiClemente & Prochaska, 1982; Jones, 1977; Newman, 1977; Pechacek & Danaher, 1979; Pederson & Lefcoe, 1976; Perri, Richards, & Schultheis, 1977). Moreover, cessation rates for unaided smokers are particularly low, falling in the 5-10% range (Bernstein & Glasgow, 1979; Health & Welfare Canada, 1981; U.S. Public Health Service, 1979), with similar figures reported for subjects in no treatment control conditions (Flaxman, 1978; Glasgow, 1978; McFall, 1978; Raw, 1978). Finally, the methodological and design problems that commonly limit the usefulness of existing data will be summarized. The section will close with the rationale and overview of the present study.

Mass Persuasion, Education and Prohibitions

These strategies are the major features of the public health approach to the smoking problem, which emphasizes community-wide health education and broad-scale policy changes. The basic assumption seems to be that the dissemination of information about the risks of smoking and the benefits of quitting, accompanied by public support for nonsmoking and public-area smoking restrictions will lead to changes in attitudes and behavior. Unfortunately, community studies have generally failed to support the validity of this assumption.

Health risk education, which uses techniques ranging from educational communications to outright scare tactics,

typically improves knowledge and motivation to change without producing actual or lasting behavior change (Flaxman, 1976; Hochbaum, 1975; Houpt, Orleans, George, & Brodie, 1979; Roberts, 1975; Thompson, 1978). Moreover, health risk education may not always be appropriate or even helpful. Smokers who have already heard multiple warnings about smoking and are already highly motivated to quit may be immune to further communications. Or worse, they may be defiant or reactive in the face of repeated warnings causing a boomerang or "communication innoculation effect" (Green & Green, 1977). This tendency was confirmed in a study by St. Pierre (1974) which found that a "positive" treatment (e.g., reinforcement) resulted in decreased smoking whereas an "aversive" treatment (e.g., fear arousal) was associated with increased smoking among some subjects.

A number of informational procedures have been investigated whose primary objective is the arousal of intense fear in the smoker. Such scare tactics have taken the form of either role-playing a smoking victim (Lichtenstein, Keutzer, & Himes, 1969; Mann & Janis, 1968; Platt, Krassen, & Mausner, 1969; Streltzer & Koch, 1968) or vivid demonstrations regarding smoking-related disease (Levanthal, 1968; Levanthal, Watts, & Pagano, 1967). The 5-Day Plan of the Church of the Seventh Day Adventists, which has remained very active in providing treatment for smokers, has made extensive use of threatening antismoking material in its

group programs. This procedure, which has become standardized, involves five consecutive 2-hour sessions focussing on immediate cessation, and dietary, physical and attitudinal changes to reduce withdrawal effects (McFarland, 1977; McFarland, Gimbel, Donald, & Folkenberg, 1964). In general, where assessments have been done, smoking reduction tends to be temporary and/or not clearly different from that accomplished through subjects' unaided efforts (Bernstein & Glasgow, 1979; Guildford, 1972).

Strictly rational educational effects or persuasive messages not aimed at arousing fear would seem to warrant a place in a comprehensive treatment program. A promising approach, for example, involves giving smokers feedback of the immediate, reversible effects of smoking. This may have acted as a deterrent in an intervention designed to help adolescents avoid becoming regular smokers (Evans, Rozelle, Mittelmark, Hansen, Bane, & Havis, 1978). Other research suggests that educational campaigns could benefit from a focus on the benefits of cessation, downplaying the harmful effects of continuing to smoke. An expectation of quitting benefits, and a motivation to improve one's health, rather than a fear of smoking risks, seem to predict success in quitting (Eiser & Sutton, 1977; Eisinger, 1971, 1972; Mausner, 1973).

Recent educational campaigns have focussed on the effects of passive smoking and have addressed issues of

nonsmokers' rights and their enforcement. Shor and Williams (1978, 1979) documented that nonsmokers frequently experienced adverse physiological and psychological reactions to second-hand smoke, but often hid their true feelings and failed to request changes in smokers' behavior. Assertiveness training for reticent nonsmokers could assist them in standing up for their rights (Pachman & Frederiksen, 1979). Smoking restrictions or absolute bans in public areas will further intensify the pressures on smokers to quit and possibly strengthen their motivation to do so (Leventhal & Cleary, 1980).

To date, evaluations of smoking prohibitions have been limited to opinion surveys. Preliminary results have been somewhat surprising: smokers generally ignore non-smoking signs, responding more favorably to polite requests to refrain from smoking. Unfortunately, nonsmokers are frequently inhibited from making such requests because they fear being seen as "oddballs, spoil sports, or trouble-makers" (Shor & Williams, 1978). A goal of the Generation campaign, launched recently by Health and Welfare Canada (1982), is obviously appropriate--to encourage a comfortable social milieu for nonsmokers. Its success will be determined in the coming years.

Despite the facilitating effects of persuasive communications, the major limitation of health risk education programs is their lack of meaningful action plans (Leventhal

& Cleary, 1980) or specific skills training in behavior change (Best & Bloch, 1979). Hence, the initial motivation enhancing messages need to be followed by specific procedures to execute the behavioral intentions. This latter step should positively alter the strength of the smoker's self-efficacy expectation (Bandura, 1977), or perceived personal ability to reach a goal or outcome. These expectations could have considerable influence both on the degree of persistence in efforts to quit and on the long-term success of the effort (Pechacek & Danaher, 1979). Leventhal (1973, 1974) found that specific instructions on how to control smoking significantly improved the effectiveness of fear messages in reducing smoking at 3-month follow-up. However, specific action plans had no effects on attitudes or behavior when presented without a persuasive message. It appears that both motivation and action plans are necessary for behavior change. The integration of attitude and behavior change procedures certainly seems worthy of further investigation.

Medical Counselling and Pharmacological Treatment

Smoking cessation counselling by physicians represents a potentially powerful intervention tactic that has received only limited research attention. While a majority of physicians seem convinced of the health consequences of smoking and the number of regular smokers among them has declined (Health & Welfare Canada, 1981; U.S. Public Health

service, 1977), many are still reluctant to advise their healthy patients not to smoke. Surveys carried out in the United States have found that physicians there are generally doubtful about the value of quit-smoking advice, and are skeptical about any treatment offering much help to smokers (Rose, 1977). Nevertheless, Rose (1977) and Lichtenstein and Danaher (1978), after reviewing the available data, have concluded that physician advice can be effective when delivered in the context of personal health care, in face to face interactions, when tied to knowledge of personal vulnerability for a serious smoking related illness, and with follow-up attention.

The cessation data on high-risk groups with current medical problems support their conclusions. Twenty to 30% 1-year quit rates are common for smokers who know themselves at risk for coronary heart disease, and for smokers with existing cardiorespiratory illnesses (Pederson, 1982; Rose, 1977; Rose & Hamilton, 1978). Post myocardial infarction (MI) patients, for whom the risks of smoking are more immediate and salient, have the highest quit rates of any group; 50-60% of those advised to quit are still abstinent at 1-year (Croog & Richards, 1977; Lichtenstein & Danaher, 1978; Rose, 1977; Wilhelmsson, Vedin, Elmfeldt, Tibblin, & Wilhelmsen, 1975). On the other hand, for predominantly healthy smokers, physicians' quit-smoking advice generally produces 5-8% 1-year abstinence rates (Russell, Wilson,

Taylor, & Baker, 1979). This is no higher than the spontaneous quit rate of unaided smokers.

Thus, although physicians have opportunities for antismoking counselling, it is not yet clear how and to whom their efforts should be directed. Both Rose (1977) and Lichtenstein and Danaher (1978) have warned that the private practitioner should avoid unrealistic expectations and underestimations of the time required. Straightforward, firm advice to stop smoking, without any accompanying treatment, or follow-up support, is unlikely to be effective with the majority of smokers. Furthermore, even high-risk smokers, who are usually highly motivated to quit, require more than conventional advice to achieve long-term abstinence. Medical counselling, which is undoubtedly an influential factor in the decision to quit, has yet to contribute much to the actual process of quitting. More controlled, comparative research is needed to determine the extent to which physician advice can facilitate this process.

For at least the last 45 years, pharmacological methods have been used in attempts to attenuate the effects of nicotine dependence (Dorsey, 1936). As research has continued to suggest that there are pharmacological determinants for smoking (McMurrow & Foxx, 1983; Pomerleau, 1980; Russell, 1976; Schachter, 1978), the search for chemical agents either to substitute for smoking or to minimize withdrawal symptoms has persisted. In general, the results have been

discouraging and have shown the effects of pharmacological cessation aids to be weak, temporary and often no greater than those of placebos (Bernstein & Glasgow, 1979; Best & Bloch, 1979; Pechacek & McAlister, 1980; Raw, 1978). Nevertheless, a number of them still enjoy rather widespread use.

Various psychoactive drugs have been utilized to treat the symptoms associated with nicotine withdrawal. Controlled studies using antianxiety drugs have found them to be almost completely ineffective in modifying smoking. Hydroxyzine (e.g., Atarax), meprobamate (e.g., Miltown), diazepam (e.g., Valium), and chlordiazepoxide (e.g., Librium) have all been shown to be either ineffective or no better than placebo conditions (Bartlett & Whitehead, 1967; Graff, Hammett, Bash, Fackler, Yajouski, & Goldman, 1966; Schwartz & Dubitzky, 1969; Turle, 1968; Whitehead & Davies, 1964). In fact, Raw (1978) has suggested that tranquilizers actually hinder cigarette withdrawal. Stimulants, such as amphetamine, have also been tried, either alone (Miller, 1971; Ross, 1967; Whitehead & Davies, 1964) or combined with tranquilizers (Ross, 1967). It was thought that an amphetamine might compensate for the predominantly stimulating pharmacological effect of nicotine. Despite some moderately effective short-term results, the addictive potential of this drug alone rendered it undesirable as a form of treatment.

The largest part of the literature on pharmacological cessation aids concerns the use of substances which mimic the effects of nicotine or, more recently, the use of nicotine itself as a smoking deterrent during the early stages of quitting. Lobeline, an alkaloid from the leaves of an Indian tobacco plant, shares many physiological properties with nicotine (Davison & Rosen, 1972), and combined with antacids has been marketed as a nicotine substitute in compounds such as Bantron or Smokurb. Numerous studies, using various preparations of lobeline, have indicated that it has a quick, but short-lived effect with a very high relapse rate (Davison & Rosen, 1972; Ford & Ederer, 1965). To date, Bernstein's (1969) description of the lobeline studies as "dismal" still holds (Bernstein & Glasgow, 1979; Pechacek & McAlister, 1980; Raw, 1978). Nicotine, on the other hand, when administered in cigarette equivalent doses in a peppermint-flavored chewing gum (e.g., Nicorettes) has been reported to result in reduced rate and amount of cigarette consumption (Jarvik, Glick, & Nakamura, 1970; Lucchesi, Schuster, & Emley, 1967; Russell, Raw, & Jarvis, 1980), longer latencies to subsequent cigarettes, and a reduced number of puffs (Kozlowski, Jarvik, & Gritz, 1974). Double-blind studies using the gum in cessation clinics suggested that it is slightly more effective than placebos (Brantmark, Ohlin, & Westling, 1973; Fagerstrom, 1982; Ohlin, Lundh, & Westling, 1976; Russell, Wilson, Feyerabend, & Cole,

1976), but beyond the control of withdrawal symptoms, it has the disadvantage of all drug treatments in that it leaves the problem of preventing relapse untouched (Gritz & Jarvik, 1977; Raw, 1978). Moreover, questions regarding its ultimate safety remain unanswered (Hartelius & Tibbling, 1976). Drug treatments thus may be viewed most appropriately as short-term cessation aids with notoriously low success rates.

Hypnosis

Hypnosis has been applied to the problem of smoking with uncertain results. In addition to some basic design flaws, the literature in this area is confounded by the unresolved issue of what hypnosis is. Procedural details, when provided, vary greatly among studies, and the only commonality frequently is the use of the word hypnosis (Bernstein & McAlister, 1976; Frederiksen & Simon, 1979; Johnston & Donoghue, 1971; Raw, 1978). Although high success rates have been claimed for hypnosis, these have been demonstrated only in uncontrolled case studies (Crasilneck & Hall, 1975; Kline, 1970; Nuland & Field, 1970; von Dedenroth, 1968). When subjected to careful experimental control, it appears to be no better than other techniques, nor has it been shown to be better than nonspecific placebo treatment (Edwards, 1964; Perry & Mullen, 1975).

The confusion is further exacerbated by the multi-component approach that most hypnotherapists use (Bernstein

& Glasgow, 1979; Best & Bloch, 1979; Leventhal & Cleary, 1980). A frequently used hypnotic approach, for example, involves the establishment of an aversive state in association with the smell and/or taste of cigarette smoke (Johnston & Donoghue, 1971; Orne, 1977). This approach is analogous to Cautela's (1967) covert-sensitization procedure. Similarly, von Dedenroth (1968) reported a treatment procedure involving four sessions during which a series of suggestions was given and then repeated and reinforced while the patient was in a trance state. The list of suggestions could easily be described as stimulus control (Bernstein & Glasgow, 1979; Raw, 1978) and similar suggestions have been made in more recent self-management approaches to smoking cessation. Thus, if hypnosis works at all, it may be that it does so for the same reasons that behavioral methods work (Raw, 1978). At this stage, it can only be concluded that the efficacy of hypnosis per se as a treatment technique for smoking has yet to be clearly demonstrated.

Behavior Modification Approaches

Behavioral explanations of cigarette dependence have changed over time. Early theories were based on principles derived from experimental psychology and research on animal learning. Accordingly, smoking was seen as an overlearned, maladaptive habit whose acquisition and maintenance could be explained by principles of operant and classical

conditioning (Bernstein, 1969; Hunt, 1973; Hunt & Matarazzo, 1970). Thus, when the issue of cessation was considered, the control of antecedent and consequent environmental events was emphasized (Bernstein, 1969; Keutzer, Lichtenstein, & Mees, 1968). Social learning concepts later extended this view to incorporate principles of modeling and social reinforcement (Bandura, 1969; Franks, 1969) into theories about the origin and maintenance of smoking behavior (Bergen & Olesen, 1963; Borgatta & Evans, 1968; Borland & Rudolph, 1975; Gorsuch & Butler, 1976; Smith, 1970) and into methods of deterrence and cessation (Bewley & Bland, 1977; Bynner, 1970; Evans, 1976; Evans, Henderson, Hill, & Raines, 1979; Lichtenstein, 1977; Pomerleau & Pomerleau, 1977). More recently, the importance of mediational variables such as cognitions and emotions have been recognized, largely through the growth of cognitive behavior modification (Best & Hakstian, 1978; Mahoney, 1974; Marlatt & Gordon, 1980; Meichenbaum, 1977; Pechacek & Danaher, 1979; Pomerleau, 1980, 1981).

Currently, there are two relatively distinct behavioral approaches to the modification of smoking: aversive conditioning and self-control training. A large body of research exists related to both strategies, and indicates success rates generally superior to those discussed above. Unfortunately, few of these studies are without major methodological shortcomings. These will be highlighted at the close of this section.

Aversion procedures. Aversive techniques are considered appropriate for gaining control over behaviors that are either highly rewarding or physically damaging, when control is unlikely to be achieved by other means. Because smoking meets both of these conditions, it was readily identified as a target for aversive control procedures. The underlying mechanisms, however, remain in dispute and it is likely that both classical and operant conditioning processes are contributing to the effective application of aversion therapy (Bandura, 1969; Danaher, 1977b; Glasgow, Lichtenstein, Beaver, & O'Neill, 1981; Norton & Barske, 1977).

A variety of noxious stimuli have been used in the treatment of smokers, including white noise (Green, 1964), aversive tasting substances (Marston & McFall, 1971; Seltzer, 1975; Whitman, 1972), electric shock (Conway, 1977; Lichtenstein & Keutzer, 1971; Russell, Armstrong, & Patel, 1976), negative imagery (Barbarin, 1978; Cautela, 1970; Steffy, Meichenbaum, & Best, 1970), and smoke itself (Bernstein & McAlister, 1977; Danaher, 1977a; Lichtenstein & Danaher, 1976). Presentation has occurred coincident with or following actual or imagined smoking. Early and recent reviews of the smoking literature (Bernstein, 1969; Bernstein & Glasgow, 1979; Bernstein & McAlister, 1976; Lichtenstein & Danaher, 1976; Lichtenstein & Keutzer, 1971; Raw, 1978) have tended to support the position of Lublin

(1969) and Wilson and Davison (1969) that aversive approaches which make use of stimuli of the same modality as the target behavior are more effective than approaches using dissimilar conditioning stimuli. Fairly consistent positive findings have emerged from studies using cigarette smoke as the aversive stimulus, particularly when utilized in a rapid smoking format. Less successful results have been reported with the remaining aversive procedures.

Danaher (1977b), in his review of the smoking research, has described this over-smoking procedure as an "outstanding exception to the disappointing trend" of contemporary treatment approaches. Originating with the work of Lichtenstein and his colleagues (Harris & Lichtenstein, 1971; Lichtenstein, 1975; Lichtenstein, Harris, Birchler, Wahl, & Schmahl, 1973; Lichtenstein & Rodrigues, 1977; Schmahl, Lichtenstein, & Harris, 1972), rapid smoking requires the participant to smoke successive cigarettes (preferred brand) in an accelerated manner by puffing every 6 seconds while paying attention to the negative aspects of the experience. This is continued until no more can be tolerated, followed by a short (approximately 5 minutes) rest period, and the procedure is then repeated up to a maximum of three trials per session. Participants are discouraged from smoking between sessions. A total of six to eight sessions are used, depending on progress in the control of smoking urges (Lichtenstein, 1975).

Early experiments with this technique produced promising, although not unambiguous results. In the first study involving the now standard rapid smoking format, Schmahl, Lichtenstein and Harris (1972) compared the addition of either hot smoky or cool mentholated air blown in subjects' faces while rapid smoking. All subjects reported total abstinence at the end of treatment and 57% remained so at a 6-month telephone follow-up. There was no difference in outcome between the two treatment groups. A later study by Lichtenstein, Harris, Birchler, Wahl, and Schmahl (1973), which included an attention-placebo group, found no difference between aversive procedures (warm smoky air plus rapid smoking, warm smoky air only, rapid smoking only), but did demonstrate a significant treatment effect at 6-month follow-up. Although all subjects but one were abstinent at termination, the relapse curve was steeper for an attention-placebo group, with 30% abstinent at 6-month follow-up compared with 60% in each of the three aversion groups. The surprising success of controls during treatment prompted Lichtenstein and his colleagues to carry out a third study (Harris & Lichtenstein, 1971) in which all subjects received rapid smoking while three "nonspecific" social or relationship factors were varied (verbal reinforcement, relationship with therapist, expectation of success) along with treatment format (individual vs. group). This manipulation produced a strong effect at the end of treatment and at 3-month

follow-up with 72% of the "enriched" social interaction and relationship group being abstinent at follow-up compared with 6% of the "deprived" group. These differences were independent of whether subjects were seen individually or in small groups.

In their review of this procedure, Lichtenstein and Danaher (1976) concluded that "rapid smoking administered in a warm, contingently persuasive interpersonal context leads to significant smoking reduction and cessation." Although a large source of variance has been attributed to nonspecific, interpersonal factors, Lichtenstein and Danaher further conclude, somewhat inconsistently, that rapid smoking per se is a significant variable, with roughly 50% of treated subjects abstinent for 3 to 6 months posttreatment. Danaher (1977b) has attempted to account for less successful results on the basis of modifications in the treatment format. Among the parameters which have differed from Lichtenstein's original procedures are the number of cigarettes consumed and number of smoking trials per session, the number and scheduling of treatment sessions, rapid smoking outside of sessions, the omission of the warm, contingently persuasive interpersonal context and the cognitive rehearsal of aversive aspects, and variations in the size and composition of treatment groups (Danaher, 1977b). Indeed, more research remains to be undertaken to determine the most effective components and combination as well as for whom these procedures might be maximally effective (Best, 1975;

Danaher, 1977b; Frederiksen & Simon, 1979).

More recent studies have not really clarified the picture with regard to rapid smoking, and many have achieved considerably lower success rates than those emerging from Lichtenstein's program. Raw and Russell (1980), for example, compared rapid smoking (adhering closely to the standard format) with cue exposure (to smoking related stimuli and accompanied by response prevention) and simple support (involving self-monitoring, and therapist and group support) and found no difference between the three groups with only 14% abstinent overall at 1-year follow-up. Glasgow (1978) obtained similarly disappointing findings of 16% abstinent at 6 months following treatment with either rapid or normal paced smoking. The inclusion of a self-control manual and "high" therapist contact (e.g., seven meetings over a 3-week period) did not enhance the treatment effect. Best (1975) reported a somewhat higher rate of 31.5% abstinent at 6-month follow-up, but his design did not include an attention control as all subjects received rapid smoking in addition to various tailoring procedures. Lando (1978) contrasted rapid smoking with a slow-smoking control and also evaluated the incremental effectiveness of stimulus control and contractual management. The only treatment effect to reach significance was rapid smoking, but this disappeared by 6-month follow-up at which time overall abstinence was 28%. This finding was in sharp contrast to Lando's previous study (1977) which found a 76% 6-month

abstinence rate with an exploratory two-stage program consisting of aversive conditioning (in this case, satiation) and self-management techniques. Control subjects limited to satiation only achieved a 6-month abstinence rate of 35%. Lando (1978) suggested that factors such as group cohesiveness and treatment complexity might account for the discrepant outcomes.

Satiation has been used as an aversion procedure by Best and his associates (Best, Owen, & Trentadue, 1978) in combination with self-management training. When compared with a similar program using rapid smoking, the investigators found no significant difference between the two procedures and reported an overall abstinence rate of 47% at 6 months (35% if drop-outs are included). Delahunt and Curran (1976) have also published some encouraging data on the effectiveness of satiation when combined with self-management training. Fifty-six percent of their combined treatment group, in contrast with only 22% of the subjects in either of the single treatment groups, were abstinent at 6 months. This study also included an attention control group which achieved 11% abstinence for the same follow-up period. Other studies employing satiation have yielded more negative results (Lando, 1975, 1981, 1982; Lando & McGovern, 1982; Sutherland, Amit, Golden, & Roseberger, 1975).

Rapid smoking is undoubtedly the most widely researched aversion method. It has spawned, as Lichtenstein (1982) so aptly puts it, not only a sizeable outcome

literature, but also a controversial literature concerning side effects and health risks. Satiation has, to date, escaped such scrutiny, although an evaluation of its physiological effects and associated risks would be valuable (Best, Owen, & Trentadue, 1978). A number of studies have been undertaken to quantify the impact of rapid smoking on the cardiovascular system (Danaher, Lichtenstein, & Sullivan, 1976; Dawley, Ellithorpe, & Tretola, 1976; Hall, Sachs, & Hall, 1979; Hynd, O'Neal, & Severson, 1976; Miller, Schilling, Logan, & Johnson, 1977); much of the data has been summarized by Lichtenstein and Glasgow (1977), and more recently by Lichtenstein (1982). These studies have documented that rapid smoking produces significant increases in heart rate, blood pressure and carboxyhemoglobin levels, which contraindicates the procedure for individuals with pulmonary or cardiovascular diseases. It has also been recommended that other high risk groups be screened out, notably men over 50 and women over 55, diabetics, and pregnant women. Thus, it seems that the procedure can only be regarded as safe for nonsymptomatic young to middle-aged adults. Clearly, these considerations limit the applicability of rapid smoking and comparably risky procedures (Lichtenstein, 1982). In fact, given the repeated finding that other treatment approaches, among them self-management and simple support, do as well in long-term abstinence, it may be argued that there is no justification

for the use of any potentially hazardous aversive technique (Raw, 1978).

Self-management methods. Kanfer (1980), among others (e.g., Newman & Bloom, 1981a, 1981b; Thoresen & Mahoney, 1974), has suggested that smoking is a self-control problem because it requires a self-initiated decrease in a behavior with immediate positive consequences (e.g., reduces tension, alleviates boredom) in favor of delayed negative reinforcement (e.g., avoiding cancer, cardiovascular and other disorders). It is the building of a controlling response and the conflicting consequences of the current behavior that differentiate self-control problems from problems of self-regulation. Kanfer has also proposed that self-control proceeds in two stages which involve different response requirements. In decisional self-control, a person is faced with a choice in which a tempting alternative is given up in favor of an alternative which has greater ultimate (but delayed) utility. Making the decision terminates the behavioral sequence. In contrast, protracted self-control situations involve resistance to temptation or tolerance of discomfort over a prolonged interval, during which the conflicting responses can be continually re-evaluated. It is obvious, in comparing the two situations, that techniques to master both types of self-control are necessary in a complete treatment program. Unfortunately

this has seldom been the case in self-control oriented programs for smoking cessation.

A large number of different techniques have been categorized under the rubric of self-control. Self-control training programs have included stimulus control (Bernard & Efran, 1972; Claiborn, Lewis, & Humble, 1972; Greenberg & Altman, 1976), self-reward for nonsmoking and self-punishment for smoking (Axelrod, Hall, Weis, & Rohrer, 1974; Brockway, Kleinmann, Edleson, & Gruenewald, 1977; Lando, 1977; Murray & Hobbs, 1981), contingency contracting (Elliot & Tighe, 1968; Lando, 1976; Paxton, 1980; Spring, Sipich, Trimble, & Goeckner, 1978; Winnett, 1973), anxiety management and relaxation training (Beaver, Brown, & Lichtenstein, 1981; Best, Owen, & Trentadue, 1978; O'Connor & Stravynski, 1982; Sutherland, Amit, Golden, & Roseberger, 1975), various forms of cognitive therapy (Blittner, Goldberg, & Merbaum, 1978; Candiotte & Lichtenstein, 1981; Danaher, 1976; DiClemente, 1981; Kopel, 1975; Sachs, Bean, & Morrow, 1970; Sipich, Russell, & Tobias, 1974; Steffy, Meichenbaum, & Best, 1970; Wagner & Bragg, 1970; Weiss, 1974; Wisocki & Rooney, 1974), and response substitution (Best & Bloch, 1979; Pomerleau, Adkins, & Pertschuk, 1978). Individually, these techniques have not demonstrated much success. Multicomponent self-control treatment packages, however, seem to hold somewhat more promise (Bernstein & Glasgow, 1979; Best & Bloch, 1979; Lichtenstein & Danaher,

1976; Pechacek & Danaher, 1979; Pomerleau, 1979; Raw, 1978).

The failure of single self-control strategies to eliminate cigarette smoking is not surprising given the limited scope of such programs and the multiple determinants of smoking behavior. It has become increasingly clear to researchers (Best, 1975; Best & Bloch, 1979; Best & Steffy, 1971; Delahunt & Curran, 1976; Pomerleau, 1979, 1981; Schachter, 1982) that an individual's smoking behavior is maintained by many factors and that an effective cessation program must incorporate diverse treatment strategies. This view suggests presenting a smorgasbord of techniques and allowing the smoker to pick those that seem best suited to his individual style and needs (Best & Bloch, 1979). The focus is on the individual as change agent and on the application of self-management tactics outside of treatment sessions, often by means of homework assignments.

This approach offers a number of advantages in addition to the acquisition of specific and personally relevant coping skills. A comprehensive self-control program with an inherent problem-solving focus can enhance expectations of mastery and self-efficacy. Bandura (1977) has defined perceived self-efficacy as the conviction or belief that one can successfully execute the behavior or behaviors that a situation requires to produce the outcome that is desired. According to this theory, perceived self-efficacy is the critical element in therapeutic change and

the level, strength, and generality of these altered expectations should predict the long-term maintenance of treatment gains. Thus, for smokers, the actual efficacy of treatment would depend upon how well the program is able to provide the skills needed to cope with specific problem situations during both cessation and maintenance. Moreover, it has been suggested that a self-attribution of success, rather than an attribution to some external aspect of treatment, will promote long-term change (Best & Bloch, 1979; Davidson, 1976; Kopel & Arkowitz, 1975; Pechacek & Danaher, 1979). There is also some evidence to suggest that high levels of self-efficacy might, in the event of a slip, insulate the ex-smoker from the "abstinence violation effect" and subsequent relapse (Condiotte & Lichtenstein, 1981; Marlatt & Gordon, 1980).

From an empirical standpoint, relatively few well-controlled studies have been undertaken to evaluate multi-component self-control programs. Pomerleau and his associates (Pomerleau, Adkins, & Pertschuk, 1978; Pomerleau, Bass, & Crown, 1975) have reported results based on the first 100 smokers treated in their clinical research program. At the end of treatment, 61% of participants had quit; 9 months later, 32% of all smokers who entered treatment were abstinent. Their program included a wide range of self-management strategies and the self-report data were verified by urinary nicotine assays. Flaxman (1978) used self-control techniques (including stimulus control, muscle relaxation,

self-reinforcements, social support, and cognitive procedures) as a foundation upon which the effects of other procedures could be observed. Interestingly enough, she found that the self-control package was significantly more effective when subjects stopped smoking on a selected target date than when subjects quit either immediately or gradually tapered off. A 6-month follow-up revealed that 56% of the subjects in the self-control-plus-target-date group remained abstinent. The addition of rapid smoking to this treatment combination did not significantly enhance the outcome. These positive findings are tempered somewhat by a small sample size, lack of a "pure" attention control, and unverified self-report data.

Other investigations combining self-control and aversion procedures have produced conflicting results. Delahunt and Curran (1976) evaluated satiation and self-control training in isolation and in combination, and compared these to an attention and a waiting-list control. Six-month abstinence data were 56%, 22%, 22%, and 11% respectively, for the combined, self-control, satiation, and attention-control groups. Self-report validity was enhanced by collected but unanalyzed saliva for thiocyanate assays. Conway (1977), who unfortunately presents only percentage of baserate smoking figures rather than abstinence data, found self-management training generally enhanced the effects of aversion (which included shock, and covert aversion), but

not significantly over an attention-control. Lando and his associates (Lando, 1977, 1978, 1981, 1982; Lando & McGovern, 1982) have reported mixed results with similar combinations (see section on rapid smoking). Powell and McCann (1981) combined self-control techniques and a novel aversive smoking procedure and obtained an impressive (although unverified) 63% abstinent at 1-year follow-up. Best, Bass and Owen (1977), in a study evaluating various aspects of service-delivery (such as group size, telephone support, and therapist training), reported a 6-month abstinence figure of 38%, with a trend toward better outcome for smaller groups. The treatment program involved a combination of satiation, rapid smoking, and self-management training. The design did not include an attention-control group, nor an objective measure of cigarette consumption.

The above-cited investigations suggest that, while theoretically interesting, self-control programs have not generally succeeded in inhibiting the pervasive relapse rates found in the smoking literature. However, logic would argue that a comprehensive, well-designed self-control treatment package should hold great promise, and that the failure of some programs may be due to the manner in which they are administered. The reviews of the literature all consistently conclude that work in behavioral self-control is still in its infancy, and the final answer will not be available until additional empirical tests have been concluded (Frederiksen

& Simon, 1979; Lichtenstein, 1982; Lichtenstein & Danaher, 1976; Pechacek & Danaher, 1979; Pomerleau, 1979; Raw, 1978).

Methodological Problems

It has been said that it is always possible to find fault with experimental work (Raw, 1978) and the area of smoking modification is certainly no exception. Methodological issues have been discussed in every review of the area as well as in two guides for the design of smoking cessation studies (Berglund et al., 1974; McFall, 1978). There appears to be general consensus about the need for greater experimental control, but the following errors of method are particularly noteworthy.

The dependent variable typically employed in smoking research is daily cigarette consumption, and the required data are obtained through one of the following procedures: Self-report, collaborator report, or physiological measures. Self-monitored cigarette consumption, by far the most commonly used outcome measure, may be biased, inaccurate or falsified, and McFall (1978), among others, recommends that such data be validated by more objective measures. The report of a collaborator, someone in a position to observe closely a subject's smoking behavior, has been increasingly used for such a purpose. This method is probably most accurate when the informant is reporting on a subject's abstinence rather than on smoking rate (McFall, 1978).

physiological measures of smoking have been developed recently as a result of doubts about the validity of the previous two sources of data as the main indices of treatment effectiveness. Carbon monoxide in expired air, or nicotine and thiocyanate levels in urine, saliva, or blood are currently available biochemical measures of exposure to smoke. However, these measures are also not without disadvantages, among them confounding by nonsmoking sources, short half-lives, and the issues of intrusiveness and cost. In general, a convincing argument for the validity of the dependent measure can only be made when there is congruence among several independently derived measures (McFall, 1978).

An additional problem associated with the outcome measure commonly used in smoking research is one of relevance. Although smoking rate, or percent reduction are frequently adopted as dependent measures it is not appropriate to rely solely on rate data when drawing conclusions about treatment effectiveness. Abstinence, as a clinical goal, is more meaningful than reduced smoking for a number of reasons. Despite recent assertions that "controlled smoking" may be a viable option for those unable or unwilling to quit (Frederiksen & Peterson, 1976), follow-up data have indicated that if individuals do not become completely abstinent a return to baseline rates eventually ensues (Hunt & Belpalec, 1974). Moreover, unlike alcohol consumption, all tobacco smoking is a health hazard, both for the smoker and those in the smoker's environment. Finally, from an empirical standpoint,

abstinence reports are more easily corroborated objectively, and are less susceptible to the reactivity of self-monitoring (Lichtenstein & Danaher, 1976; McFall, 1978).

Particularly important in clinical research are controls for participation and subject expectancy (Campbell & Stanley, 1963; Mahoney, 1978). However, despite the demonstration by McFall and Hammen (1971) of the role played by nonspecific treatment factors, subsequent smoking studies have seldom included a true placebo (as opposed to waiting-list) control in their design. This neglect has severely limited the conclusions that can reliably be made from much of the existing outcome research.

A final methodological problem in smoking cessation studies concerns the length of the follow-up period. As has been pointed out in a previous section, sustained treatment gains are notoriously difficult to achieve with any addiction (Hunt, Barnett, & Branch, 1971), and smoking is no exception. Although recidivism tends to be greatest during the first 3 months after treatment, a 12-month follow-up should be the rule (Berglund et al., 1974; McFall, 1978). In addition, follow-up data should be based on all subjects who entered treatment, including drop-outs. Those who are not available for follow-up assessment should be regarded as treatment failures (Berglund et al., 1974). Generally, these design standards are not adhered to in smoking cessation experiments.

Purpose of the Present Study

As with many other areas of behavioral medicine, research on the use of behavior-change procedures in the treatment of dependent smokers has shown enormous growth in the past decade. Unfortunately, a consistently effective cessation program has not yet been achieved. In addition, the maintenance of change and the prevention of relapse are key unresolved issues. Empirical evidence suggests that the use of multicomponent approaches, especially ones incorporating aversive methods and individually tailored self-management training, may be an effective means of attaining and maintaining more successful outcomes. However, as Lichtenstein himself seems to recognize (Lichtenstein, 1982), the limited applicability, not to mention the unpleasantness of aversive procedures make it unlikely that they will ever be widely accepted. On the other hand, the lack of clear superiority of self-management programs over appropriate controls and the continuing pattern of nonreplication do not lend strong support to this approach. Moreover, the overwhelming majority of controlled studies employing self-management training have failed to alter the consistent time course for recidivism that has been established in the outcome literature. Nevertheless, more work is clearly indicated since carefully developed, multicomponent, self-management programs may contain greater potential for producing improved treatment outcome.

In light of these considerations it was decided to undertake a research project aimed at evaluating aversive and self-control approaches to smoking cessation in isolation, and in combination, in comparison to a credible attention-control group. Particular attention was paid to overcoming the methodological and design deficiencies that plague the field. Thus in the application of rapid smoking, Lichtenstein's procedural guide (1975) was closely adhered to. In addition, four follow-up intervals were established, with the last to occur 1-year posttreatment. Treatment duration, therapist contact, and nonspecific factors were held constant across the four groups. Finally, an attempt was made to objectively verify the main outcome measure, abstinence.

Hypotheses. While rapid smoking has achieved, to date, a slight advantage in the outcome literature, the recent successes of individualized multicomponent self-control programs (e.g., Brengelmann, 1977; Flaxman, 1978; Pomerleau, Adkins, & Pertschuk, 1976) are encouraging. On the basis of these findings, it was hypothesized that an adaptive, skills-oriented treatment utilizing cognitive and behavioral self-control strategies would be at least as effective as a rapid smoking procedure in producing long-term abstinence. A clear-cut demonstration of the effectiveness of the former would indeed be welcome given its range of

applicability both with regard to populations and modes of service delivery.

A second hypothesis about the ultimate superiority of a treatment combining both procedures was also examined. Previous investigators (e.g., Best, Owen, & Trentadue, 1978; Delahunt & Curran, 1976; Lando, 1977) have tended to support this assumption and have suggested that rapid smoking serves to bring about abrupt cessation while self-management strategies contribute to the maintenance of change. Thus, the combined effects of both should produce greater, and more enduring smoking reduction than either one alone.

Finally, it was predicted that subjects in the attention-control group would find treatment significantly less effective than subjects in the other three treatment groups.

METHOD

Subjects

Subjects were recruited by means of a newspaper advertisement and community posters asking for participants in a treatment program to stop smoking. Ninety-five smokers responded to the announcements and were subsequently sent a screening questionnaire (see Appendix A) and record forms (see Appendix B) on which they were to record their normal smoking for a 7-day period. It was emphasized that they should continue to smoke in their usual way and make no attempt to cut down at this stage.

The screening measures were returned completed by 62 people and following a review of this material 22 were initially excluded by the following selection criteria: (a) must have smoked a minimum of 15 cigarettes per day for at least 2 years, (b) must be between 20 and 50 years of age, and (c) must be without any history of heart disease, high blood pressure, chronic bronchitis, or emphysema, and other high risk conditions such as diabetes, pregnancy and obesity. Over 70% of those excluded were unable to meet the rather rigorous health and age criteria dictated by the use of rapid smoking.

The 40 prospective subjects remaining were scheduled for individual appointments with project personnel, at which

time a registered nurse made a further assessment of their health status. Also, at this time, the prospective subjects were provided with a brief description of the research project, including the rapid smoking component, and were asked to sign the consent form (see Appendix C). Although told they would be randomly assigned to treatment groups, the consent form required them to indicate their willingness to undergo aversive smoking, and to pay a \$40 "commitment deposit." They were told that the deposit, to be collected at the first treatment session, could be earned back in its entirety by keeping daily records of smoking (with repayments based on completeness, not content) and by providing follow-up data.

Thirty-six smokers passed this final stage of the screening process (2 individuals were eliminated for health reasons, 1 was not willing to undergo rapid smoking, and 1 indicated that he would not be available for follow-up) and were randomly assigned to one of the four treatment groups. The groups, balanced with regard to sex, consisted of 23 women and 13 men who averaged 33.8 years of age, reported a mean smoking rate of 23.9 cigarettes per day, and had smoked for an average of 16.4 years. These subjects' characteristics are summarized in Table 1. Those failing to meet the admission criteria for the study were provided with a list of alternative programs available in the community.

Table 1. Subjects' characteristics.

| | Total | Rapid Smoking | Self- Management | Combined Treatment | Attention Control |
|-----------------------------------|-------|------------------|---------------------|-----------------------|----------------------|
| N | 33 | 9 | 9 | 9 | 6 |
| Age | 33.6 | 34.3 | 36.3 | 29.9 | 34.2 |
| Education (Years) | 12.2 | 12 | 13 | 11.7 | 12 |
| Base Rate | 23.9 | 26.2 | 23.8 | 23.5 | 22.0 |
| Years Smoking | 16.4 | 17.7 | 18.1 | 13.8 | 15.8 |
| Previous Cessation Attempts | 2.6 | 3.1 | 2.6 | 2.7 | 2 |

Three subjects assigned to the attention-control group failed to attend even the first session. In accordance with the research guidelines set down by the National Interagency Council on Smoking and Health (Berglund et al., 1974), these individuals were excluded from the study population. They consisted of 2 men and 1 woman, and as the treatment programs were then underway these subjects were not replaced in the design.

Procedure

The author, who had several years of training and experience in behavior modification techniques, conducted the treatment program for all groups. She was assisted by an R.N. employed by the hospital where the study was carried out.

The attendance schedule (see Appendix D) was designed such that the treatment course lasted 5 weeks and involved 8 sessions for all subjects. Furthermore, as Danaher (1977b) and Lichtenstein (1975) have cautioned against deviations from the standard format of rapid smoking, the number and scheduling of treatment sessions followed closely Lichtenstein's procedural guidelines. The treatment sessions, conducted in group format, lasted about 75 minutes.

Treatment Programs

The first treatment session covered the following points with each group. Subjects were asked to provide the

name and telephone number of someone who would corroborate their reports of smoking behavior or abstinence at the end of treatment and during the follow-up period. Subjects were also told that unannounced urine samples for nicotine analysis would be collected during treatment and would be required at the 1- and 3-month follow-up meetings. Subjects were not asked to stop smoking at this first meeting, but to announce to friends and relatives that they would be stopping one week later (i.e., target date). The commitment deposit was also collected at this session.

The specific steps in each treatment procedure are described below. The program for the attention-control group will be presented first as it contained aspects common to all programs.

Attention-control. Subjects in this condition served as a control for nonspecific treatment factors. The nonspecific procedures used included those identified by McFall and Hammen (1971) as common to most smoking cessation studies: A structured program over a fixed time period; self-monitoring of cigarette consumption; advocacy of quitting "cold turkey"; and the use of motivated volunteers. In addition, and in contrast to McFall and Hammen's study, therapist support and encouragement played an integral role and group support was also fostered. Thus, group meetings for these subjects were devoted to mutually supportive interchanges between members concerning their successes and

failures with regard to smoking. The therapist took a supportive, but nondirective approach which included verbal praise for abstinence and reassurance about the difficulties of withdrawal. Information was given on the consequences of smoking and the benefits of stopping, and fitness and exercise were recommended as part of the development of a more healthy lifestyle. Promotional material from the Canadian Cancer Society and the Heart and Lung Association was distributed and two films (one factual and mildly fear-arousing, the other a humorous look at quitting) were shown. Opportunity was provided for discussion of the information presented. At the same time, reassurance was given concerning the efficacy of the program in facilitating abstinence. Although credibility and expectancy for improvement were not directly evaluated subjects' informal comments throughout the sessions suggested a comparability of demand characteristics across treatment conditions.

Rapid smoking. In addition to the nonspecific factors described above, subjects in this condition engaged in rapid smoking during the second to sixth sessions, inclusive, and on the seventh session only for those subjects reporting persistent smoking urges (4 out of 9). This flexible "sessions to cessation" format, rather than a fixed regimen, has been noted by Danaher (1977b) as an important, albeit frequently ignored, aspect of the standard treatment format. This was adhered to, as much as possible, by using

Lichtenstein's (1975) procedural guide.

Subjects were familiarized with the rationale of rapid smoking during the first session, and were presented with the view that smoking is a learned activity, and that habits can be unlearned as well. Rapid smoking was presented as an aid in the unlearning process by changing smoking's positive valence. Subjects were told that by making the act of smoking very unpleasant, cigarettes and other associated cues would no longer be perceived as enjoyable. This would thus make it much easier to control their smoking. They were also strongly admonished that any "normal" and between session smoking could severely impair their chances of success. A great deal of emphasis was placed upon the target date for quitting--the morning of the second session.

The rapid smoking segments, conducted during the latter part of each session, were approximately 25 to 30 minutes, including between trial rest periods. No distractions were permitted during rapid smoking, and periodic attention was drawn to the negative aspects of the experience. Attention was also called to the increasing smoke accumulating in the room. Subjects were asked to notice the contrast between the smoky room and the fresh air outside in the corridor, and were encouraged to enjoy the fresh air, and to take a drink of water, when the room was aired between trials. The actual procedure involved the following: Subjects were instructed to light a cigarette (preferred

brand) and inhale on command every 6 seconds (an audiotape with prerecorded beeps at appropriate intervals was used as the timing device). Subjects continued until they could tolerate no more, lighting fresh cigarettes as required. Each trial was followed by a rest period of approximately 5 minutes during which subjects discussed the unpleasantness of the experience. The procedure was then repeated with additional trials, until the subject could tolerate no more, or to a maximum of three trials per session, or a total of 15 minutes of rapid smoking, whichever occurred first. Subjects were cautioned that while the procedure was intended to be aversive, they were not to smoke to the point of physical illness.

The six sessions involving rapid smoking were essentially similar except that the number of cigarettes that could be tolerated without becoming ill decreased considerably after the first two sessions, as was expected (Lichtenstein, 1975). The final treatment session was devoted to supportive discussion among group members and the sharing of suggestions for remaining (or becoming) abstinent. Subjects were encouraged by the therapist to try the various suggestions and to continue to use those which they found most helpful. As in the attention-control condition, however, the therapist avoided making specific recommendations regarding self-management techniques.

Self-management. In this condition subjects were instructed in various strategies of both decisional and protracted self-control along the lines described by Kanfer (1980). Thus, in addition to the nonspecific features of the attention-control program, subjects in this group received help in acquiring specific behavior change techniques to facilitate the initial process of cessation and to ensure the maintenance of change. Subjects were presented with a variety of self-management techniques and were encouraged to employ those that they found most helpful. Emphasis was placed upon selecting strategies to develop and strengthen competing responses and to alter the conflicting consequences of the current behavior. Initially, the rearrangement of their social and physical environment was also recommended, so that the probability of smoking would be reduced (i.e., stimulus control). Suggestions such as temporarily avoiding situations in which it would be particularly tempting to smoke (e.g., social gatherings; smoking sections of restaurants or public transport; "favorite" chair at home; smoking friends, etc.), rather than hierarchical reductions (limiting smoking to increasingly narrow environmental contexts) or temporal control (smoking on a fixed-time schedule with planned reductions) were made. Subjects were instructed in the contingent use of self-generated positive and aversive consequences and were encouraged to develop competing motor behaviors (e.g., the use of gum or lifesavers, engaging in moderate exercise).

Relaxation training was also undertaken. The integration of cognitive controls into the treatment program was achieved through the use of thought stopping, covert sensitization, and self-verbalizations to deal with cravings.

Subjects were assisted by the therapist and other group members in selecting potent rewards and punishments, in identifying potential problem situations, and in planning effective coping strategies. The problem of possible weight gain, for example, was discussed, and subjects were encouraged not to attempt corrective measures until nonsmoking patterns were firmly established. Each session began with individual statements from each subject as to whether or not they had smoked. An effort was made to create an atmosphere of positive expectancy. Subjects who abstained were warmly congratulated and the group was praised as a whole for its overall level of success. If a subject had smoked, his or her difficulties in achieving total abstinence were discussed and constructive comments were solicited from the group. This provided an opportunity for all subjects to rehearse their own newly acquired skills.

The teaching of self-management procedures occurred during sessions one through five. Subsequent sessions involved continued review of subjects' progress, support and reinforcement for not smoking, and a search for new solutions to persistent problem situations. A subtle emphasis was placed upon the positive experiences resulting from abstinence. Subjects were asked to elaborate upon a variety of

positive experiences, including increased energy level, lessened congestion in the throat and chest, general sense of well-being, and feelings of self-worth and accomplishment. Discussion also focussed upon the favorable reactions of significant others to subjects' success in giving up smoking. Subjects were urged to remind themselves of all the positive aspects of not smoking when experiencing an urge to smoke, and to remind themselves often of the reasons they wanted to quit. Finally, they were warned against becoming complacent and urged not to let a single "slip" become an excuse for total relapse.

Combined treatment. In this condition, subjects were instructed in both rapid smoking and self-management strategies in a fashion similar to subjects receiving these treatments in isolation. Thus, self-management training began in the first session, and rapid smoking commenced in the second session. Rapid smoking was conducted during the last 30 minutes of each subsequent session, up to session seven, inclusive. The final session took a form similar to that of the self-management group.

Data Collection

Subjects were required to maintain continuous records of all cigarettes smoked during treatment and at predetermined follow-up intervals. The recording forms (see Appendix B) were designed to fit inside individual cigarette packages to facilitate record keeping. These forms were also used

during the pretreatment screening period, and these records provided the baseline data for all subjects. At 1-, 3-, 6-, and 12-months posttreatment subjects again recorded their smoking behavior for a 7-day period. These records were returned at a prearranged meeting for the 1- and 3-month posttreatment intervals. These meetings provided the subjects with an opportunity to discuss their progress with fellow group members and to renew their own commitment to remain (or become) abstinent. The 6- and 12-month smoking records were returned by mail.

Urine samples were collected for nicotine analysis as a check on self-reported smoking at the fourth, sixth and eighth treatment sessions and at the 1- and 3-month follow-up meetings. Although it had originally been intended to submit these samples for laboratory analysis, these procedures proved to be ultimately unavailable. It was decided, nevertheless, to continue with their collection as planned in the hope that subjects' awareness of this corroborative measure would enhance the accuracy of their self-reported smoking (Lichtenstein, 1982; Ohlin, Lundh, & Westling, 1976; Paxton, 1980).

Subjects had also supplied the name of an individual in their environment who could observe and report on their smoking patterns. Within a week following the end of treatment and during each of the follow-up periods, two-thirds of the designated informants for each group were contacted and

asked to verify subjects' reported smoking status (i.e., smoking or abstinent). Informants were selected at random.

A number of additional attitudinal and motivational measures were incorporated into the screening questionnaire, including Best's (1975) motivation "thermometer" and Keutzer's (1968) effective cognitive dissonance measure. These items were not analyzed for the present report, but the information derived from them may be useful for future program development. Subjects also completed a treatment evaluation form at the final treatment session (see Appendix E).

RESULTS

Effectiveness of Randomization

Although subjects were assigned to treatment conditions randomly, a series of one-way analyses of variance were performed to assess the probability of sampling bias with respect to subjects' smoking histories. There were no significant differences between groups on any of these pre-treatment variables. These data are summarized in Table 1 (p. 38).

Program Attrition

One subject in each of the three active treatment groups failed to complete the program (i.e., attended less than half of scheduled sessions) and did not report outcome or follow-up data. In each case, they were counted as treatment failures and for the purpose of statistical analysis these subjects were assigned their pretreatment baseline rate where data were missing. Three additional subjects could not be reached to obtain the 12-month follow-up data and in each case a return to baseline was assumed. All three subjects had been smoking in excess of 60% of their baseline rate at 6-month follow-up.

The attendance rate during treatment, calculated as the percentage of the total possible attendances, was acceptably high and similar for all groups--79.2% for rapid

smoking, 87.5% for self-management, 86.1% for combined, and 85.4% for attention control.

Validity of Self-Reports

In no case did an informant contradict a subject's reported smoking status. Although it is impossible to rule out collusion, this finding coupled with the knowledge that subjects thought their smoking records would be checked against urine analysis, supports the validity of the self-report data.

Outcome Measures

Abstinence. Table 2 shows the percentage of subjects who reported total abstinence at treatment termination and at each of the four follow-up intervals. Altogether 44% were abstinent at the end of treatment and by 3-month follow-up the relapse curve had reached asymptote at 26% abstinent. This figure remained unchanged at 12-months posttreatment. Chi-square analyses were used to test for group differences in abstinence at the end of treatment, and at 1-, 3-, 6-, and 12-month follow-up ($\chi^2 = 1.75, 0.34, 0.70, 0.60,$ and 0.75 respectively, 3 df in each case). No test yielded significant differences between the treatment groups.

Changes in consumption. Subjects' smoking rates, expressed as a percentage of their 1-week baseline rate, are presented in Figure 1. Although initial reductions in

Table 2. Percentage of subjects abstinent at end of treatment and follow-up.
(Actual frequency in parentheses)

| | All Subjects | Rapid Smoking | Self- Management | Combined Treatment | Attention Control |
|---------------------|-----------------|------------------|---------------------|-----------------------|----------------------|
| N | 33 | 9 | 9 | 9 | 6 |
| End of Treatment | 44.4 (15) | 33.3 (3) | 55.5 (5) | 55.5 (5) | 33.3 (2) |
| 1 month | 36.1 (12) | 33.3 (3) | 44.4 (4) | 33.3 (3) | 33.3 (2) |
| 3 months | 26.4 (9) | 33.3 (3) | 22.2 (2) | 33.3 (3) | 16.6 (1) |
| 6 months | 29.1 (10) | 33.3 (3) | 33.3 (3) | 33.3 (3) | 16.6 (1) |
| 12 months | 26.4 (9) | 33.3 (3) | 22.2 (2) | 33.3 (3) | 16.6 (1) |

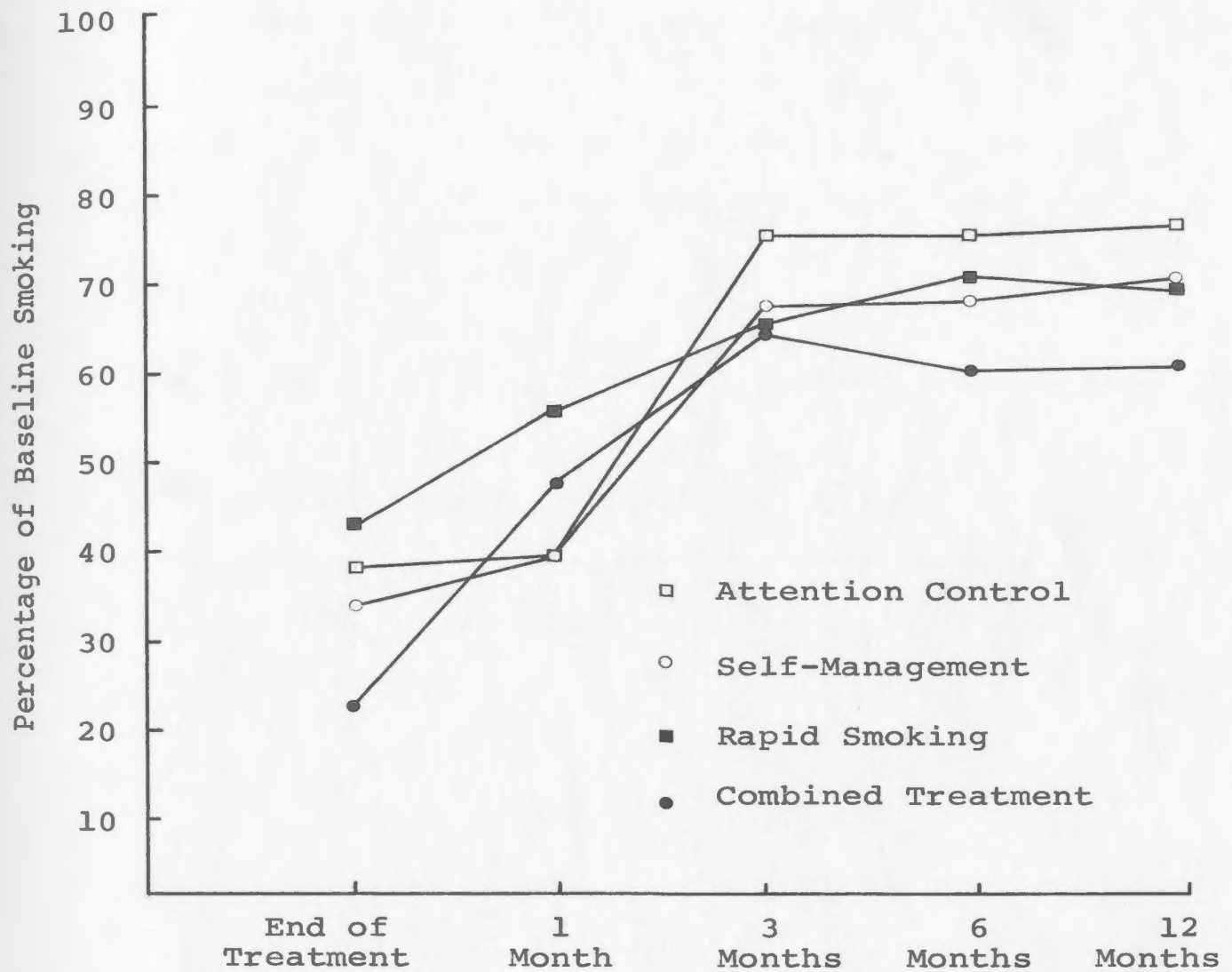


Figure 1. Mean changes in smoking rate.

smoking across all treatment conditions were fairly impressive, averaging 70%, considerable relapse occurred. The overall percentage reduction figure at 12-month follow-up was only 30%. A repeated measures analysis of variance on this data yielded a pattern similar to that obtained for abstinence. Neither end-of-treatment consumption nor percentage reduction at 1-, 3-, 6-, or 12-month follow-up showed significant differences between treatments, $F(3,29) = 0.097$, ns. The only effect to reach significance was time, $F(4,116) = 12.05$, $p < .001$. These data are summarized in Table 3.

A calculation to estimate the power of this particular F test at $p < .05$, with respect to $n = 9$, indicated a power of .40 (to detect a 5-cigarette per day difference between treatments). If a power of .90 was desired, based on the current data, calculations indicate that $n = 25$ would be required.

Table 3. Mean daily consumption at baseline and end of treatment and percent reduction in smoking at follow-up.

| | Rapid Smoking | Self- Management | Combined Treatment | Attention Control |
|---|------------------|---------------------|-----------------------|----------------------|
| <u>Mean Daily Consumption</u> (Standard deviation) | | | | |
| Baseline | 26.2 (7.0) | 23.8 (6.4) | 23.5 (7.2) | 22.0 (4.4) |
| End of Treatment | 11.1 (15.7) | 7.9 (14.8) | 5.2 (10.3) | 8.2 (8.6) |
| <u>Percent Reduction</u> | | | | |
| End of Treatment | 57.6 | 66.8 | 77.9 | 62.6 |
| 1 month | 43.9 | 60.5 | 52.3 | 60.5 |
| 3 months | 33.6 | 32.4 | 35.7 | 23.2 |
| 6 months | 29.8 | 32.8 | 39.6 | 23.6 |
| 12 months | 30.2 | 28.6 | 40.0 | 22.7 |

DISCUSSION

The findings of the present study demonstrate that abstinence can be achieved by roughly one out of every four smokers who participate in a cessation program combining social support with various other nonspecific treatment factors. These data indicate that the addition of rapid smoking and self-management training does not significantly enhance the long-term effectiveness of such a program. Both abstinence levels and changes in smoking rate were very similar in all groups, as Table 2 and Figure 1, respectively clearly show. From a cost effectiveness point of view, the nonspecific treatment program stands out as the most efficient. The translation of such a treatment into a procedure for widespread use would require only limited training of nonprofessional staff and few additional resources. Judged from this perspective, and when compared with cessation rates of 5-10% for unaided smokers, this approach seems promising.

Contrary to prediction, the present data fail to support the superiority of the behavioral techniques over the nonspecific treatment. In comparing these results with those of other behavioral efforts to modify smoking it becomes difficult to challenge the recent assertion by Leventhal and Cleary (1980) that we may be reaching the limit of effectiveness of current intervention methods. The

attainment of an overall abstinence rate of 26.4% at 1-year posttreatment coupled with nonsignificant treatment effects, although disappointing, is comparable to the results generally reported in the literature. Lichtenstein and Rodrigues (1977), Kanzler, Jaffe, and Zeidenberg (1976), and Colletti, Supnick, and Rizzo (1982), for example, have all reported 24% of their original subjects abstinent at long-term (2-6 years) follow-up. This striking similarity in outcomes occurred in spite of marked differences in treatment. Lichtenstein and Rodrigues (1977) presented data from participants in four studies utilizing rapid smoking, whereas Colletti, Supnick, and Rizzo (1982) were reporting on two smoking reductions clinics that employed nonaversive self-control techniques. In contrast, Kanzler, Jaffe, and Zeidenberg's (1976) paper provided data on the effectiveness of Smokenders, a large-scale proprietary program emphasizing group dynamics. Similar findings have emerged from a host of other studies employing various behavioral techniques (e.g., Delahunt & Curran, 1976; Lando, 1978).

Somewhat different findings have also been reported with success rates both higher (e.g., Best, Bass, & Owen, 1977; Best, Owen, & Trentadue, 1978; Flaxman, 1978; Lando, 1977; Pomerleau, Adkins, & Pertschuk, 1978) and lower (Glasgow, 1978; Lando, 1975; Raw & Russell, 1980; Sutherland, Amit, Golden, & Roseberger, 1975) than those of the present study. Thus, the present results appear to reflect the norm

for current cessation programs. Moreover, the weight of the evidence suggests that there is some feature common to the diverse array of treatments that is contributing to their similar outcomes. Certainly, as Leventhal and Cleary (1980) have suggested, it seems to be better to do something than nothing.

While not wanting to dwell on the study's flaws, there exists one major shortcoming that should be addressed before considering the meaning of the overall results. It is a design issue that has created problems for community program evaluation studies, in particular, and has recently been discussed by Cowen (1978). As he maintains, the generalization of research findings depends on representativeness of design on all pertinent dimensions. Thus, "if a program evaluation study seeks to reach conclusions that transcend a particular setting, it must adequately sample the situations and variables that are central to its generalization focus, as well as the usual adequate sampling of subjects" (Cowen, 1978, p. 796). For the present study, to generalize about the effects of group treatment would require representative sampling along the dimension of groups. In effect, then, the n for each condition would reflect the number of groups, rather than the number of subjects. The results of the power calculation carried out on the current data indicate that an n of 25 would be required to provide an adequately sensitive test of the study's hypotheses.

From this perspective, with only one group per condition, the external validity of this study is seriously jeopardized (Campbell, 1969).

Unfortunately, this weakness is chronic in smoking research. Because there are so many ways in which groups can differ (e.g., rewarding/punishing, directive/nondirective, approving/rejecting, conformity, etc.) besides the ostensible variable under study (i.e., the type of intervention approach), conclusions about the relative effectiveness of different approaches are difficult to make without representative sampling on the group dimension. Further, the critical role played by an effective supportive relationship in facilitating marked behavior change (e.g., reducing cigarette smoking or overeating) has been cogently described by Janis (1983). Evidence from a series of experiments carried out by Janis and his collaborators (Janis & Hoffman, 1982; Janis & Quinlan, 1982) on the effectiveness of short-term counseling has identified a number of key variables pertaining to the counselor-client relationship that may be crucial determinants of adherence to treatment recommendations. Clearly, these findings point to the need for a fairly refined understanding of a therapist's role in relation to treatment process and outcome. Adequate sampling along the therapist dimension, however, has not been a common feature of contemporary smoking research.

Although the present study may have avoided many of the more flagrant design deficiencies, the question of its external validity can not really be answered. For the purposes of perspective, however, it seems that the problem of generalizability is endemic in the smoking cessation literature. Investigation of the dimensions along which generality might occur is indeed difficult. Nevertheless, it is apparent that there are factors other than the therapeutic method that impact on treatment outcome (Maher, 1978; Smith & Glass, 1977). Thus, we can not realistically expect dependable and replicable treatment results without controlling for these factors. Moreover, Maher (1978), among others (Brunswik, 1947; Cowen, 1978), claims that it is an error to assume that the systematic replication of single-stimulus studies can, through an accretive process, create a representative design. This can only occur with truly representative sampling on all relevant dimensions.

The intent of the foregoing analysis is not simply to detail the constraints on the study's generalizability. Problems of representativeness of design are widespread and are thus perhaps one of the main reasons for the discrepancy between the present results and others reported in the literature. But there is still something remarkably similar about all of these studies and that is their general failure to find different effects for different treatments. It has been suggested, and the present findings support this, that

any beneficial effects are due to the common elements running through all the various treatments given by different therapists employing different kinds of interventions (Janis, 1983). Although preliminary, Janis's program of research on adherence indicates that the social support obtained in a helping relationship may be one of the key components (Janis, 1983; Rodin & Janis, 1982).

Janis's theoretical framework proposes three critical phases in almost every helping relationship which, when surmounted, increase the chances of a successful outcome. These phases, as he describes them, involve acquiring, using, and retaining "referent power"--i.e., becoming a significant other, a major determinant of social influence. Further, he has specified 12 variables within this framework that directly mediate the outcome of interventions. Confirmatory findings have been obtained for some of these variables, from a number of unrelated studies. For example, the effectiveness of giving consistently positive feedback, as compared with giving neutral or negative feedback, has been observed in several smoking cessation studies (Mermelstein, Lichtenstein, & McIntyre, 1983; Prochaska & DiClemente, 1983) and has also been demonstrated by Janis and his colleagues (Conolly, Janis, & Dowds, 1982; Greene, 1977; Nowell & Janis, 1982; Smith, 1982). Similarly, the facilitating effects of social support via high-contact partnerships during treatment has been noted by a number of investigators (Glasgow, 1978; Janis & Hoffman,

1982; Mermelstein, Lichtenstein, & McIntyre, 1983), particularly if the partner is perceived as approving and accepting. Two additional variables have received tentative empirical support. Making specific recommendations regarding actions the client should carry out and eliciting commitment to the recommended course of action have both been shown to have positive effects on behavior change (Best & Bloch, 1979; Janis & Hoffman, 1982; McFall & Hammen, 1971). The other variables specified by Janis have, to date, little research evidence bearing on them, and some contradictory data do exist (e.g., phone calls and booster sessions following treatment termination have been found to diminish (Best, Bass, & Owen, 1977; Elliot & Denny, 1978) or have no effect on outcome (Lando, 1977; Pomerleau, Adkins, & Pertschuk, 1977)). Nevertheless, it is clear that social support figures prominently in an explanation of behavioral change. What seem to be especially worth pursuing are further analyses of when, how, and why it is effective.

The point to emphasize with regard to the present study is that various aspects of social support appear, because of the lack of a significant treatment effect, to be one of the most reasonable explanations for the overall outcome. Moreover, because it is unlikely that the four groups were exposed to precisely the same degree of social support (particularly with respect to relationships between group members), these differences might account for the small,

albeit nonsignificant differences between groups and between my findings and those of other investigators. It may be, for example, that programs reporting abstinence data approaching 50% (e.g., Best, Owen, & Trentadue, 1978; Lando, 1978) have been more successful in fostering effective supportive relationships (between client and therapist or between group members). Conversely, the absence of a supportive treatment context has been noted by many investigators to be associated with poor results (Harris & Lichtenstein, 1971; Lando, 1977; McFall & Hammen, 1971; Mermelstein, Lichtenstein, & McIntyre, 1983; Raw & Russell, 1980). This then suggests the need for further systematic investigation of the causes and consequences of social support in smoking cessation programs. It is quite possible that this would prove more productive than the continued search for the ultimate smoking cure.

The results of this study corroborate the hypothesis regarding the comparable effectiveness of rapid smoking and self-management training. Although neither approach was associated with greater abstinence than that observed in the attention control group, this finding is noteworthy for a number of reasons. Rapid smoking continues to be employed fairly frequently during the cessation phase of treatment programs. This occurs despite the potential risks and somewhat limited applicability of this aversive procedure and in the face of accumulating evidence that it is no more

effective than other methods. One possible explanation for its lack of success is that the procedure provides a reward for smoking (in the form of increased plasma nicotine levels) at the point at which the desire to smoke is highest and does not generate disgust or aversion for smoking until the desire to smoke is gone (Leventhal & Cleary, 1980). What Leventhal and Cleary's (1980) analysis suggests is that this conditioning process strengthens the avoidance of smoking only to cues of nicotine excess. In fact, this phenomenon was noted by the majority of subjects undergoing rapid smoking in the present study, and reports of the initial puffs being reinforcing were exceedingly common. Clearly, this was counter-therapeutic.

One of the major shortcomings of the study's self-management program may have been that it did not integrate attitude and behavior change procedures well enough. Flay (1981), in a discussion of the communication process in health promotion programs, has suggested that any change attempt needs to aim for consistency both within and between cognitive, affective, and behavioral structures. His principle criticism of mass media health promotion programs is that while they are presumably meant to lead to changes in attitudes and behavior, they tend to focus their attention only on achieving changes in knowledge and beliefs (i.e., cognitions). In contrast, however, most behavioral approaches to the modification of smoking typically concern

themselves with providing the appropriate behavioral control and skills without attending to the antecedent conditions that increase the likelihood of behavior change--changes in knowledge, beliefs, and attitudes. While it is reasonable to assume that the subjects in the present study were roughly equivalent in their knowledge about smoking and its consequences, it is quite probable that they held dissimilar beliefs and attitudes that were more or less conducive to behavior change. All subjects, for example, might have thought that smoking causes cancer for the general population (belief), whereas only a proportion of them may have felt personally vulnerable (attitude). Flay (1981), in affirming the multifactorial nature of the causes of behavior, maintains that a comprehensive behavior change program must address all of these causal links to be effective. Unfortunately, the self-management program in this study incorporated only limited procedures for attitude change, and failed altogether to include a measure of change at that level. Further research is needed to both corroborate and expand on these ideas.

With regard to the study's internal validity, it is undeniably jeopardized by the reliance on self-report data for information about subjects' smoking behavior. However, four things contribute to the attenuation of this risk. The high rate of concordance between subjects' self-reports of abstinence and the reports of informants was an encouraging

finding. Although the possibility of collusion still exists, this possibility seems remote, since there would be no apparent gain for lying. A second, and related point concerns the treatment context. The therapist actively avoided making subjects feel guilty for "failing," and gave selective positive feedback for all approximations of effective coping. It is assumed that such a stance would deter faking (Raw & Russell, 1980). Also, subjects' awareness of occasional biochemical checks has been shown to enhance the honesty and accuracy of self-reported smoking rate (Evans, Hansen, & Mittelman, 1977; Glasgow, 1978; Paxton & Bernacca, 1979; Sutherland, Amit, Golden, & Roseberger, 1975). That the urine samples collected for the present study could not be analyzed, should not alter this fact. Finally, there is no reason to assume differential reliability in reports between conditions. This would be the major threat to internal validity.

The issue of regimen compliance, particularly with the self-management program, deserves consideration. The attendance data and subjects' willingness to self-monitor cigarette consumption were the only direct measures of adherence to treatment recommendations. The results with regard to these process variables are quite acceptable. However, the extent to which subjects actually carried out any of the diverse self-management strategies was never directly assessed. While such information would certainly

have been interesting it would, in effect, have required compliance with the compliance measure and thus have been potentially difficult to obtain. Lengthy and time-consuming self-monitoring procedures are known to suffer from problems of inaccuracy and reactivity (McFall, 1977; Nelson, 1977), which is perhaps why measures of adherence are so infrequently incorporated into research on behavior change. Nevertheless, the study of compliance might help to increase our understanding of the large individual variation noted throughout the smoking literature.

In conclusion, the results of this study indicate that rapid smoking, an established intervention, no longer merits the prominent position it has occupied in behavioral approaches to smoking cessation. In fact, the data suggest that there is no empirical basis for employing this unpleasant and potentially harmful procedure. Despite similar findings for the self-management program, it is a more recent and less risky intervention and thus deserves further systematic investigation. Its effectiveness may be enhanced considerably through an increased focus on the cognitive and affective aspects of the cessation process. In addition, greater attention must be paid to the facilitating role of various forms of social support. The optimum quantity and form of this key variable have yet to be determined. Future research in this direction will hopefully improve both the effectiveness and the efficiency of attempts to eliminate this tenacious health problem.

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APPENDIX A
SCREENING QUESTIONNAIRE

THE GENERAL HOSPITAL SMOKING CONTROL PROGRAM

INTAKE QUESTIONNAIRE

All information submitted will be kept confidential.
Please answer all questions.

- I: 1. Name _____
2. Age _____
3. Sex: () Male () Female
4. Phone number where you can be reached:
During the day _____
Evenings _____
5. Occupation _____
6. Highest grade or degree obtained: _____
7. Marital status:
() Single () Separated
() Married () Divorced
() Widowed
8. Number of children, if any: _____

II. SMOKING HABITS AND HISTORY

1. How old were you when you started smoking cigarettes regularly?

(years of age)
2. Have you ever made a serious attempt to stop smoking entirely?

() Yes () No (if No go to question 8)
3. If Yes, how many times? _____
4. How long ago was the most recent time you tried to stop smoking?
() Less than 6 months ago () 1 - 2 years ago
() 6 months - 1 year ago () 3 or more years ago

5. What is the longest period of time you quit smoking completely?

- ☐ Less than 24 hours
- ☐ One to six days
- ☐ One week or more, but less than one month
- ☐ One to three months
- ☐ Three to six months
- ☐ Six to twelve months
- ☐ Over one year

6. What was/were the main reason(s) you tried to stop smoking the last time? (CHECK AS MANY AS APPLY)

- ☐ I noticed certain symptoms in my health
- ☐ Suggested or ordered by my physician
- ☐ Protect my future health
- ☐ Scientific reports convinced me
- ☐ Save my money
- ☐ Self-discipline
- ☐ Pressure from friends to do so
- ☐ Pressure from family to do so
- ☐ Set a good example for children and teenagers
- ☐ Set a good example for others (please specify) _____

☐ Religious reasons

☐ Just stopped - no particular reason

☐ Other reasons (please specify) _____

7. Have you ever used any particular method or technique to try to quit smoking?

() None

() Public Service Program (e.g.: Five Day Plan, Cancer Society)

() Commercial Program (e.g.: Hypnosis, Acupuncture)

() Drug Store Remedy (e.g.: Nicorette Gum, Bantron)

() Other (describe) _____

8. On the average how much do you smoke per day?

_____ cigarettes per day
Number

_____ cigars/cigarillos per day
Number

_____ pipefuls per day
Number

9. What brand do you smoke? _____

10. Do you inhale? Always _____ Sometimes _____
Never _____

11. Do you smoke more during the morning than during the rest of the day?

() Yes () No

12. How soon after you wake up do you smoke your first cigarette?

13. Which cigarette would you hate to give up? _____

14. Do you find it difficult to refrain from smoking in places where it is forbidden, e.g.: church, at the library, cinema, etc.?

15. Do you smoke if you are so ill that you are in bed most of the day?

16. How often do you smoke while at work?

() Frequently () Rarely

() Occasionally () Never

17. At the specific location where you work (i.e.: in the work area or place where you spend most of your working day), at the present time is smoking prohibited entirely, restricted to certain times or places, or are there no rules at all about smoking?

() Prohibited entirely () No rules
() Restricted () Not applicable

18. Recently, there has been some concern expressed about the rights of the individual to breathe air unpolluted by cigarette, pipe, and cigar smoke. Would you recommend that public health organizations take an active role in protecting these rights?

() Yes, I would definitely recommend it
() I would be inclined to recommend it
() I would be inclined not to recommend it
() No, I would definitely not recommend it.

19. How strong is your motivation to quit smoking? (Indicate with an "X" anywhere on the line).

weak moderate strong

20. How strong is your desire to continue smoking?

weak moderate strong

21. How probable do you think it is that you will succeed in giving up smoking by the end of this smoking control project?

() 95% (high probability)
() 75%
() 50%
() 25%
() 5% (low probability)

22. What is your present weight? _____
" " " " height? _____

III.

SMOKING RATIONALIZATIONS

Directions: Below are some statements which are frequently given as reasons why a person continues to smoke. Please check the ones (X) that you could endorse or go along with:

1. _____ The relationship between smoking and cancer has not really been proven.
2. _____ Smoking probably won't shorten my life by more than five years, and it's better to enjoy life than to live five years longer and be unhappy.
3. _____ I've been smoking so long that the damage, if any, has already been done.
4. _____ I'm truly addicted and therefore unable to stop.
5. _____ We don't stop the use of alcohol or automobiles, yet they are more dangerous than cigarettes.
6. _____ I have to smoke to relieve my nerves.
7. _____ I smoke filter tips; the harmful material has been largely removed.
8. _____ When I stop smoking I gain weight and that's just as bad.
9. _____ Anything (including cigarettes) is good in moderation and bad in excess.
10. _____ I personally know of at least one very old person who has smoked most of his life yet who continues to be in fine health.
11. _____ Cancer comes with age and heredity. There is no cancer in my family so therefore I need not worry much about it.
12. _____ Hydrogen bombs, highway accidents, murders, alcoholism, suicide - there is no safety anywhere so why worry?
13. _____ The pleasure I get, which is certain, outweighs the health hazard, which is uncertain.
14. _____ The emotional effects of my going without cigarettes are more hazardous to me than is smoking.

III. (cont'd)

15. _____ Scientific research will develop a "safe" cigarette before too long, and the effects of my smoking between now and then are probably insignificant.
16. _____ So smoking proves I'm weak-willed. Everybody's entitled to one weakness.

If you quit smoking right away, at what age (barring unforeseen accidents) might you honestly predict you would die?

If you continued to smoke (and barring unforeseen accidents), at what age might you honestly predict you would die?

IV.

MEDICAL SCREENING

1. Are you currently under the regular care of a physician?

Yes _____ No _____

2. If yes, for what condition? _____

3. Have you ever had

a) a heart attack Yes _____ No _____

b) a stroke Yes _____ No _____

c) any indication of
heart trouble Yes _____ No _____

d) high blood pressure Yes _____ No _____

e) shortness of breath
when climbing stairs Yes _____ No _____

f) emphysema Yes _____ No _____

g) tuberculosis Yes _____ No _____

h) bronchitis Yes _____ No _____

i) decreased blood flow
to your limbs Yes _____ No _____

j) diabetes Yes _____ No _____

k) asthma Yes _____ No _____

l) chest pains Yes _____ No _____

4. To your knowledge is your health impaired in any way?

Yes _____ No _____

5. For any items you answered yes, please give a brief description and the approximate date.

APPENDIX B
SELF-MONITORING FORM

SMOKING RECORD

NAME: _____

DATE: _____

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | | | | | | | | | |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | | | | | | | | | |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| | | | | | | | | | |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| | | | | | | | | | |

DAY'S TOTAL: _____

APPENDIX C
CONSENT FORM

GENERAL HOSPITAL SMOKING CONTROL PROJECT

INFORMED CONSENT STATEMENT FOR SMOKERS

Please read the following material carefully. They contain a general description of the project that you have volunteered for and a description of the discomforts, risks and benefits that might be involved. Feel free to ask any questions about any of the material contained here. When you feel you understand the program and if you are willing to participate, please sign in the space indicated.

GENERAL OUTLINE OF THE PROJECT

This is a research project which aims to help you in controlling your smoking. Because of the research nature of the project, it is important that you be careful and honest in responding to all project questionnaires. Your obligation is to faithfully provide us with the various kinds of information we request, and to follow treatment procedures to the best of your ability. All information you provide us with will be held confidential and will be accessible only to authorized project personnel. Our obligation is to try to help you control your smoking to the best of our ability within the limits of the project.

You have been asked to put down a monetary deposit of \$40 to help insure that you will follow through with the program. Half of the deposit will be returned to you at the end of the treatment program, and the remainder at the 6-month follow-up session. Reimbursement will be dependent upon your full participation in the program, including regular meeting attendance and self-monitoring of cigarette consumption.

The purpose of the project is to compare the effectiveness of several different methods for producing enduring cessation of smoking. All participants will receive a core treatment program which has been found to be quite effective relative to other known methods. We are interested in comparing different ways of further improving the effectiveness of this core program. Thus, in addition to this core treatment, you will receive at least one other treatment component, and it will be a matter of chance as to which of the additional components you receive. At this time, we have no knowledge of which ones are more or less valuable. However, we think that all can be of benefit. There will be certain assignments or procedures for you to carry out in your home. After your treatment is over, we will continue to stay in contact with you to find out how you are doing. Follow-up meetings are planned for 1-, 3-, 6-, and 12-months after the end of the treatment program. All procedures will be fully explained to you as we go along.

RAPID SMOKING

This component will involve having you smoke rapidly and continually until the act of smoking becomes very unpleasant. This procedure is aimed at helping you to control your smoking by making the act of smoking and associated cues aversive. Rapid smoking will lead to discomfort and it also involves a small degree of risk.

Discomfort: The procedure will cause you considerable discomfort - in fact it has to be unpleasant to work. Different people react in different ways. Some get dizzy; some get nauseous. A few may vomit, though we want you to stop short of this. Irritation of the throat, chest, tongue, and eyes may occur. Your clothes and hair will smell.

Risk: Rapid smoking - taking a drag every six seconds - will considerably increase your intake of nicotine. The effect of this increased nicotine intake will be that heart rate will increase considerably, thus presenting an immediate strain on your cardiovascular system. This cardiovascular strain can be dangerous for persons with heart disease. That is why we asked you a number of questions about your medical condition. If you do have known heart or vascular disease, then the rapid smoking procedure is not appropriate for you.

While there is much less risk involved for persons with no known history of heart or vascular disease, it must be emphasized that some degree of risk does remain. You should also be aware that the risk of a cardiovascular accident increases with age, particularly for men over 40 and women over 50 (or post-menopause). That is why we want you to consider this issue, and to give you more information about the potential risk involved we have attached a copy of an article by a physician and a comment on that article. This material is short and you should read it before agreeing to participate.

We believe that the degree of risk is quite small and is outweighed by the possible advantages of your getting help in controlling your smoking. If you do not want to undergo rapid smoking, however, we will assist you with your smoking in some other way. If you wish to participate you should sign the attached consent form.

RAPID SMOKING AS A TECHNIQUE OF BEHAVIOR MODIFICATION:CAUTION IN SELECTION OF SUBJECTS

I have recently become involved in the modification of smoking behavior, and the article by Lichtenstein, Harris, Wahl, and Schmahl (1973) in the February issue of the Journal of Consulting and Clinical Psychology came to my attention. The authors recommend the study and use of a technique which in fact can have fatal consequences for some people, and great caution is necessary in applying it.

Specifically, rapid smoking as a method of aversion therapy must be seriously questioned because of the potentially harmful effects it can have on certain people with advanced coronary artery disease. The authors suggest that the technique may become valuable in the clinical setting. However, unless extensive screening techniques are used to evaluate each participant in advance of aversive therapy, the procedure could possibly precipitate a fatal heart attack.

The young age of many subjects used in current experiments with this method is not a guarantee of freedom from possible complications. Several articles (Enos, Holmes, & Beyer, 1953; McNamara et al., 1971) in the medical literature in the United States show that as many as 75% of men in their 20's have already developed detectable coronary artery lesions, some of them of serious proportions even in subjects who are asymptomatic. Furthermore, the mean age reported in Lichtenstein et al.'s study was 32.2, so that most of the subjects were well within the age range of possible advanced coronary disease.

While the method probably would not seriously affect people without coronary disease, it should be noted that rapid smoking can lead to absorption of increased amounts of nicotine into the system. This in turn could induce, even in a fully healthy subject, cardiac arrhythmias that under certain conditions could lead to death. On the basis of ethics, therefore, I must condemn the further use of the technique in studies on the modification of smoking behavior unless subjects are first given adequate medical evaluation and clearance.

Robert Hauser. Journal of Consulting and Clinical Psychology, 1974, 42, 625.

COMMENT: LICHTENSTEIN REPLIES

Hauser (1974) has rightly pointed out the need for screening before using rapid smoking or the closely related satiation and blown, smoky air procedures.

In our recent work with rapid smoking, all subjects fill out a questionnaire which includes items pertaining to respiratory and cardiac symptoms. Anyone reporting such symptoms is required to obtain his doctor's permission before participating in our program. I cannot recall any physician recommending against participation.

We have not described or recommended screening procedures in our published work, although I have done so in oral presentations and informal correspondence. Researchers and clinicians who use physical aversion are expected to take necessary precautions as a matter of course. The use of electric shock also requires screening for cardiac symptoms, but this is rarely mentioned in published work. Hauser's comment serves as a useful correction to our omission of the need for a screening procedure.

I suggest, however, that Hauser has overstated the degree of risk involved and am concerned that the tone of his comment (e.g.: "extensive screening techniques") may scare investigators away from a method that has shown promise (in several studies besides our own work) and that can be applied safely. The research and service projects I have been associated with have treated approximately 270 smokers with the rapid smoking procedure. In addition, numerous other investigators have used rapid smoking (Best, 1973; Lando, 1972; Keutzer, 1968; Marrone, Merskamer, & Salzberg, 1970; Marston & McFall, 1971; McCallum, 1971; Resnick, 1968a, 1968b; Sushinsky, 1972) with many hundreds of smokers of various ages. I am not aware of any serious side effects resulting from this work.

There appears to be considerable diversity of opinion concerning the riskiness of rapid smoking and degree of screening required. I suggest that potential users of the method consult their own medical advisors--and protection of human subjects review committees where appropriate--in order to select an appropriate course of action.

Edward Lichtenstein. Journal of Consulting and Clinical Psychology, 1974, 42, 626.

Informed Consent Agreement

I have read the description of the smoking program, and understand the monetary deposit involved. I agree to participate and cooperate to the best of my ability.

Date

Signature

Received from _____, the sum of
forty dollars (40) in ~~cash~~/cheque, in full payment of the
"commitment fee" for the Smoking Cessation Program.

Date

Signature

APPENDIX D
TREATMENT SCHEDULE

THE TREATMENT SCHEDULE

RAPID SMOKING

| Week | 1 | 2 | | | 3 | | 4 | 5 |
|-------------------|---|---|----|---|---|---|---|---|
| Treatment Session | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Day | W | W | TH | F | M | F | W | W |

SELF-MANAGEMENT

| Week | 1 | 2 | | 3 | | 4 | | 5 |
|-------------------|---|---|----|---|----|---|----|----|
| Treatment Session | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Day | T | T | TH | T | TH | T | TH | TH |

COMBINED

| Week | 1 | 2 | | | 3 | | 4 | 5 |
|-------------------|---|---|----|---|---|---|---|---|
| Treatment Session | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Day | W | W | TH | F | M | F | W | W |

ATTENTION CONTROL

| Week | 1 | 2 | | 3 | | 4 | | 5 |
|-------------------|---|---|----|---|----|---|----|----|
| Treatment Session | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Day | T | T | TH | T | TH | T | TH | TH |

APPENDIX E
PROGRAM EVALUATION FORM

SMOKING CESSATION PROGRAM EVALUATION

NAME: _____

1. What aspect(s) of the program did you find particularly helpful?

2. Was there anything that you did not like, or that you think could be improved upon?

3. Would you recommend the program to a friend?

YES _____

NO _____

4. Do you think that you have succeeded in quitting smoking?

YES _____

NO _____

NOT SURE (please elaborate) _____

