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Self-Monitoring and Reactivity in the Modification of Cigarette Smoking

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The reactive effects of self-monitoring as a function of varying the specific nature of the target behavior and the perceived negative consequences of the behavior were investigated with chronic smokers as subjects. Forty subjects were assigned to one of four conditions from stratified blocks based on initial smoking rates: (a) self-monitoring nicotine plus health hazard information; (b) self-monitoring nicotine with no health hazard information; (c) self-monitoring cigarettes plus health information; and (d) self-monitoring cigarettes with no health information. Subjects self-monitored during a 4-week nondemand phase and during a 4-week treatment phase or until they quit smoking. The two nicotine self-monitoring groups showed greater reactivity. There were no differences among groups as a function of exposure to health hazard information. Results are discussed in relation to models of self-control and previous investigations of other important parameters of reactive self-monitoring.

Research on self-monitoring has focused increasingly on whether its effects are reactive, that is, whether the target behavior being monitored is changed. To the extent that its effects prove to be reactive, self-monitoring might be used as an agent of behavior change in its own right. As a rule, most behavioral self-control treatment programs have included self-monitoring simply as an assessment device and/or as a component of other self-control procedures (e.g., Stuart & Davis, 1972).

The findings on the reactivity of self-monitoring have been mixed. (See reviews of Kazdin, 1974b, & Nelson, 1977.) On the one hand, self-monitoring has been shown to be reactive in a wide range of behaviors (e.g., Broden, Hall, & Mitts, 1971; Gottman & McFall, 1972; Herbert & Baer, 1972; Romanczyk, Tracey, Wilson, & Thorpe, 1973). On the other hand, several studies have indicated that self-monitoring does not result in behavior change (e.g., Berecz, 1972; Mahoney, Moura, & Wade, 1973). Moreover, the direction of the behavior change produced by self-monitoring has been shown to differ across studies (McFall, 1970; McFall & Hammen, 1971).

Much of the evidence is inconsistent, and some of the conclusions that have been drawn are premature because of the misleading way in which the problem has been posed. The question, "Is self-monitoring reactive?" is too simplistic. The more meaningful question to ask is, "What effects occur, under what conditions, in what behaviors, with what subjects, as a function of what specific self-monitoring procedure?" (Sieck & McFall, 1976, p. 958). In laboratory-based studies, Kazdin (1974a) showed that self-monitoring was reactive; that valence, (i.e., whether the behavior was regarded positively or negatively) determined the direction of behavior change; and that both self-monitoring and the valence of the target behavior were neces-

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sary for behavior change. Similar studies using laboratory tasks as target behaviors have corroborated these findings (Cavior & Marabotto, 1976; Sieck & McFall, 1976).

The nature of the target behaviors used in these laboratory-based studies of self-monitoring have to be borne in mind in evaluating their relevance to clinical behavior-change strategies. Both Kazdin (1974a) and Sieck and McFall (1976) studied target behaviors that were not intrinsically valenced in order to manipulate experimentally the effects of different valences. There are differences between these types of studies and studies of the motivated client who is asked to self-monitor an addictive behavior such as overeating or cigarette smoking that he/she wishes to modify. The present study investigated the effects of how the specific nature of the response affects the reactivity of self-monitoring in the context of a clinically relevant investigation of the modification of cigarette smoking.

Results from the treatment of obesity have shown that self-monitoring of caloric intake is reactive (Green, 1978; Romanczyk, 1974; Romanczyk et al., 1973), whereas self-monitoring of daily weight and eating habits alone is not (Mahoney, 1974; Mahoney et al., 1973). The greater reactivity of self-monitoring calories has been ascribed to the fact that this information is more functional and is more immediately related to weight control (Romanczyk et al., 1973). If this line of reasoning is valid, it should be possible to produce similar outcome patterns in the self-monitoring of other addictive behaviors. With cigarette smoking, for example, it might be predicted that self-monitoring the nicotine content of each cigarette would be more effective in reducing smoking rates than simply self-monitoring the number of cigarettes smoked.

Kazdin's (1974a) rationale for studying the reactivity of self-monitoring on a laboratory task was based in part on the assumption that "the social value valence of a clinically relevant behavior such as overeating or smoking . . . is determined by social custom and cannot be manipulated in its own right" (p. 714). Although it might be impossible to study clinically relevant behavior like smoking in the absence of an intrinsic valence, valence can be manipulated experimentally. In the present study half of the subjects were systematically exposed to explicit information detailing the health hazards of cigarette smoking. This procedure was designed to enhance the negative valence that presumably exists normally.

The present study was designed to examine two main issues: (a) the importance of the specific nature of the target behavior in determining reactivity of self-monitoring and (b) the role of the valence of a clinically relevant target behavior (cigarette smoking) in self-monitoring effects. A major methodological problem in research on self-monitoring has been the failure to separate the specific effects of self-monitoring from the demand characteristics of the situation. If subjects are told or come to believe that monitoring their behavior might modify it, the observed changes cannot be attributed unambiguously to self-monitoring (e.g., Herbert & Baer, 1972). Accordingly, a procedure similar to that employed by Romanczyk et al. (1973) in which self-monitoring was presented as merely preparatory to the actual treatment was used to control for the effects of therapeutic demand characteristics.

Method

Subjects

Forty subjects were selected from approximately 75 respondents to a local newspaper advertisement. Selection criteria for inclusion in the study required that subjects were (a) between 20 and 55 years of age; (b) not currently taking any medication and not under the care of a physician; (c) presently smoking a minimum of 15 cigarettes per day and had been smoking for at least 2 years; (d) willing to participate in a research project that entailed different data-gathering procedures; and (e) willing to deposit $10, refundable on completion of the program.

Therapists

The first author and a senior graduate student in clinical psychology conducted all treatment sessions. Each therapist met with the same groups of subjects in each of the four experimental conditions for 1 hour per week over a total period of 8 weeks.

Thus, there were eight separate groups of clients, which allowed therapist replication to be analyzed in a $2 \times 2 \times 2$ factorial design (Therapist × Self-Monitoring × Information Condition). Standardization of treatment procedures were ensured as far as possible by therapists jointly planning each session and following written guidelines during the actual sessions.

Procedure

When subjects responded to the advertisement, they were briefly interviewed over the telephone and, if interested, they were requested to obtain an estimate of their current smoking rate by counting the number of cigarettes smoked and noting the number each night for 3 consecutive nights. Immediately after the telephone interview, a life-history questionnaire and a consent form were mailed to respondents, who were requested to complete and return them together with their estimated current smoking rates and the $10 deposit. Subjects who completed the requirements were screened and assigned to one of the five initial smoking rate categories: 15–24; 25–34; 35–44; 45–54; and over 55 cigarettes per day. Subjects from each of these five categories were randomly assigned to one of the eight treatment groups on the basis of within-sample matching.

The study consisted of eight weekly sessions. The first four sessions constituted the nondemand phase that was presented to subjects as merely preparatory to the actual treatment phase, that is, the last 4 weeks. This nondemand phase was adapted from Steinmark and Borkovec's (1974) use of a counter-demand procedure to control for the influence of subjects' expectancies of treatment improvement. However, instead of informing subjects that *no* change was to be expected until the actual treatment phase, the therapists who participated in this study gave the following rationale: "Different people react differently to these suggestions—some people increase their smoking rate, some people stay the same and others decrease their smoking rate."

Session 1

Group 1—self-monitoring cigarettes plus health information. Subjects were provided with self-monitoring cards (small enough to fit into a cigarette packet) and graph paper to record mean daily consumption based on each week's records. Subjects were instructed to place a checkmark on the small card whenever they smoked a cigarette, just before they actually lit the cigarette. Subjects were shown how to estimate their mean daily cigarette consumption averaged over the week and were requested to record this on their graphs that were retained at home.

Following the self-monitoring instructions, informative pamphlets on various health hazards of smoking such as cancer, effects on cardiovascular functioning, emphysema, and so on were distributed. These pamphlets were made available by the American Cancer Association. The distribution of pamphlets was followed by a 10-minute discussion of the major statistics concerning smokers versus nonsmokers and the altered incidence of various diseases. Next, the major ingredients in cigarettes and cigarette smoke such as nicotine, tars, and poisonous gases were listed and discussed in terms of the effects of different quantities of these chemicals on bodily functioning. Subjects were encouraged to read the materials at home, to think about various health topics during the week, and to prepare questions for discussion during subsequent weeks.

Group 2—self-monitoring cigarettes with no health information. The self-monitoring procedure was exactly the same as for Group 1. After receiving the self-monitoring instructions, the group participated in a discussion about why they responded to the advertisement and how they felt about attending the program. Subjects were asked to talk about themselves and their backgrounds to get to know the other members of the group. They were told that during the next few weeks discussions about their hopes and fears and any other thoughts or feelings that were important to them would be encouraged. Any questions referring to health hazard information were answered as briefly as possible with minimal specific information given. Subjects were informed that open discussions would help everyone understand each other's smoking problems so that these problems could be treated effectively later on in the program.

Group 3—self-monitoring nicotine plus health information. Subjects were provided with the same cards and graphs as the cigarette monitoring groups except that the words *nicotine per cigarette* replaced the word *cigarette* at the top of the cards and graphs. The scale on the graph was marked in milligrams of nicotine consumed instead of number of cigarettes smoked. Subjects were instructed to place a checkmark on the small card before they lit their cigarettes. They were told that this mark actually represented the amount of nicotine contained in the cigarette they were about to consume. Subjects were shown how to convert number of marks on the card to total amount of nicotine smoked by multiplying the nicotine content printed on their pack of cigarettes by the total number of checkmarks for the week. Thus, mean daily nicotine consumption averaged over the week was calculated and transferred to the graphs that were retained at home. The remainder of the session was devoted to providing the health hazard information and was identical to Group 1 in this respect.

Group 4—self-monitoring nicotine with no health information. The self-monitoring instructions for this group were the same as for Group 3, and the no-health-information condition was the same as for Group 2.

Sessions 2–4

To standardize procedures across the two self-monitoring conditions even further, Groups 1 and 3 and 2 and 4 were combined for Sessions 2–4. Seating was arranged to minimize contact between nicotine and cigarette self-monitoring groups, and data cards were collected at the door as soon as the subjects entered the room. Subjects were asked to consult their therapists after the session (so as not to take up class time) if they had any questions about self-monitoring. In other words, for the next three sessions, clients met in groups of 10 with those who were all in the same information condition (information or no information) with one or the other therapist.

Subjects in the information condition were shown a film called *The Embattled Lung* that depicted the health hazards of smoking, including a brief sequence on a medical examination of cancerous lungs. Ten minutes of the session were also devoted to a discussion of the film. Subjects in the no-information condition were encouraged to self-disclose thoughts and feelings about smoking and fears of quitting. They focused on their own habits, moods, and reasons why they enjoyed or did not enjoy smoking. During the last 10 minutes of Session 2, all groups were requested to complete a homework assignment designed to make them more familiar with their smoking habits by noting mood changes and situations in which they smoked during a typical day.

The same format for Session 2 was followed for Sessions 3 and 4. Specific health topics were chosen and presented to the information groups, whereas the no-information groups participated in general open-ended discussions about situational and personal characteristics of their smoking habits.

Session 5

During this session clients were once more divided into the original eight groups. The assessment questionnaires were administered to the groups immediately upon their arrival. After the questionnaires were completed, a standard behavioral treatment program was implemented with a goal of total abstinence after 3 weeks. Self-monitoring was continued as before.

Treatment Program

All groups received a multifaceted, behavioral self-control treatment program that included the following elements: stimulus control, relaxation training, goal setting, and group pressure. Specific weekly goals were set; clients were requested to reduce their smoking by 50% in the first week of treatment and by 75% in the second week of treatment. They were then told to pick a quitting day early in the 3rd week to achieve total abstinence before the end of the treatment period. As long as clients were smoking, they were to continue self-monitoring every cigarette smoked. During every treatment session each client's current smoking rate was displayed on a blackboard visible to all members of the group, so that social pressure was also part of the treatment program.

Assessment Procedures

The following questionnaires were administered at the beginning of Session 1: (a) the Health Locus of Control Scale (Wallsten, Wallsten, Kaplan, & Maides, 1976) and (b) an attitudes and beliefs scale consisting of five items to be rated on 7-point scales. The items included questions on the following: extent of belief that smoking is a serious health hazard; confidence in one's ability to stop smoking with the program; current motivation to stop smoking; extent of belief that nicotine and tars increase one's chances of suffering from a cardiovascular disease; and (c) a 10-item health and smoking quiz based on factual health information.

Both the attitudes and belief scale and the health and smoking quiz were readministered at the beginning of the fifth session. In addition, the following measures were taken at that time: rating of satisfaction with the therapist and the content of the program on 7-point scales and a questionnaire containing an embedded item (as a manipulation check) to evaluate whether clients in the two self-monitoring conditions were aware of the different self-monitoring instructions, either via friends in other groups or as a result of participation in the joint sessions. Another item asked clients to comment on the directional effect of the self-monitoring with regard to what they were actually told by the therapist and what they personally expected. At the end of the treatment phase, the attitudes and belief scale and the ratings of satisfaction with the content of the program and with the therapists were administered again.

Results

Pretreatment

The mean age of subjects was 36.4 years (range = 23–54 years). Their mean initial smoking rate was 35.37 cigarettes per day. Fixed effects $2 \times 2 \times 2$ analyses of variance showed no significant differences among groups on any of the following initial measures: age, initial smoking rate, numbers of years smoking, motivation to stop smoking, score on the health quiz, ratings of attitudes about the health hazards of smoking or about the health locus of control scale. There were more female than male subjects (26 vs. 14),

with at least 1 but no more than 3 males assigned to any one group of 5 subjects. During the 4-week nondemand phase, a total of 5 subjects missed one session and 2 subjects missed two sessions. In these cases subjects were telephoned to obtain estimates of their smoking frequency. In addition, subjects were reminded to bring completed self-recorded data cards with them to the next session. Only 1 subject in Group 2 failed to hand in the missing data card. Her estimate of smoking frequency obtained by telephone was retained in the data analysis. No subjects dropped out during the nondemand phase, although 3 subjects did not complete the entire 8-week program.

Nondemand Manipulation Check

In line with the nondemand instructions that they had been provided, subjects indicated on their posttreatment responses that the therapist had informed them that their smoking rates might increase, decrease, or remain unchanged. No subject queried the authenticity of the nondemand phase, nor did any subject indicate awareness that his or her smoking behavior during the phase was expected to decrease.

Smoking Frequency

Subject's mean daily cigarette consumption was based on the eight 1-week blocks of self-monitoring data. For every subject, these eight means were transformed to the percentage of initial (baseline) smoking frequency by dividing each week's mean by the initial smoking rate and multiplying by 100.

Nondemand phase. A fixed effects $2 \times 2 \times 2 \times 4$ repeated measures analysis of variance (Therapist × Self-Monitoring × Health Information × Time) showed that the therapist factor was not significant either as a main effect or as an interaction effect. There was a significant main effect for self-monitoring, $F(1, 32) = 10.55$, $p < .005$; the groups that had been instructed to self-monitor the nicotine content per cigarette had reduced their smoking rates more than the groups that had self-monitored number of cigarettes smoked. There was also a significant main effect for time (weeks), indicating that all groups manifested decreases in smoking rates over the 4-week nondemand period, $F(3, 96) = 29.82$, $p < .001$. The Time × Self-Monitoring interaction approached significance, $F(3, 96) = 2.60$, $p < .07$. Figure 1 presents these findings for the self-monitoring and information conditions collapsed across the therapist factor.

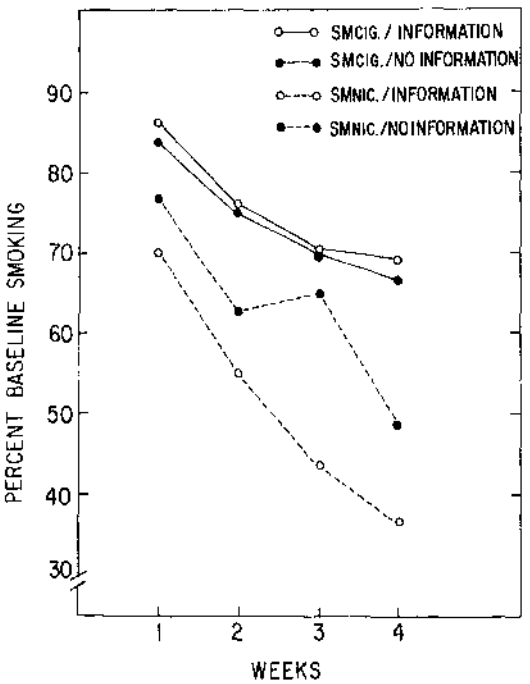

Figure 1. Percentage of baseline smoking rates over the nondemand phase. (SMCIG./INFORMATION = self-monitoring cigarettes plus health information; SMCIG./NO INFORMATION = self-monitoring cigarettes with no health information; SMNIC./INFORMATION = self-monitoring nicotine plus health hazard information; SMNIC./NO INFORMATION = self-monitoring nicotine with no health hazard information.)

Duncan's new multiple-range test was used to examine the nature of the differences between the groups on the mean percentage of pretreatment smoking over the 4-week period. The nicotine self-monitoring plus health information group showed the greatest reduction in smoking rate. Their mean rate differed significantly from both cigarette self-monitoring groups ($p < .05$) but did not differ significantly from the nicotine self-monitoring with no information group. The nicotine self-monitoring with no information group did not, however, differ significantly

Table 1
Initial Smoking Rate, Percentages of Initial Smoking Rate Over 8 Weeks, and Mean Percentages of Initial Smoking Rate

Condition				% and *M* % of initial smoking rate over 8 weeks											
				Nondemand phase					Treatment phase						
Therapist	Information	Self-monitoring	Initial mean daily smoking rate	1	2	3	4	*m*	5	6	7	8	*m*	Overall *m*	Final *N*
A	Information	Cigarette	35.0	84.8	71.0	65.1	64.4	71.4	27.9	27.0	20.6	23.1	24.7	48.0	5
A	Information	Nicotine	33.0	78.3	55.9	42.0	35.3	52.8	25.7	21.7	23.2	20.7	22.8	37.9	4
A	No information	Cigarette	34.0	80.2	67.8	64.2	57.9	67.5	47.7	26.1	24.6	30.8	30.3	49.9	4
A	No information	Nicotine	36.0	77.9	64.5	62.2	41.3	61.5	33.8	32.4	21.7	20.9	27.2	44.4	5
B	Information	Cigarette	33.0	85.7	79.9	74.9	73.1	78.4	31.0	23.2	24.9	28.9	27.0	52.7	5
B	Information	Nicotine	43.0	61.8	54.7	46.6	39.0	50.5	32.9	20.6	27.0	25.6	26.5	38.5	5
B	No information	Cigarette	33.0	86.0	81.3	73.9	75.5	79.2	29.0	31.8	24.0	21.9	26.7	52.9	4
B	No information	Nicotine	36.0	75.6	63.5	69.9	57.8	66.7	36.8	25.1	30.9	29.4	30.6	48.7	5

from the two cigarette self-monitoring groups.

Treatment phase. A $2 \times 2 \times 2 \times 8$ repeated measures analysis of variance (Therapist × Self-Monitoring × Health Information × Time) shows a marginally significant main effect for self-monitoring, $F(1, 29) = 3.46$, $p < .08$. There was a highly significant main effect for time, $F(7, 203) = 62.8$, $p < .001$. A second analysis was conducted in which the three subjects who dropped out of treatment were included as treatment failures. This procedure did not alter the pattern of results. Table 1 summarizes all of the smoking rate data over the full 8-week period.

Subjective Measures

Fixed effects $2 \times 2 \times 2$ (Therapist × Self-Monitoring × Health Information) analyses of variance for the prenondemand–postnondemand phase and the pretreatment–posttreatment phase difference scores on the self-report measures show no significant results except for the following: A significant effect for health information was shown on the health quiz, $F(1, 32) = 66.0$, $p < .001$. The mean change in health knowledge as measured by the 10-item quiz was +3.4 for the information factor (Groups 1 and 3) and −.3 for the no-information groups. No interactions even approached significance. Subject motivation showed a significant Self-Monitoring × Health Information interaction effect, $F(1, 32) = 4.87$, $p < .05$. Mean changes in motivation for Groups 1–4 were .3, −.4, −.3, and .6, respectively, on the 7-point scale. A post-hoc median split on the Health Locus of Control Scale score (high vs. low) was used as a factor in a $2 \times 2 \times 2$ analysis of variance (High/Low × Self-Monitoring × Health Information) on the mean percentage of original smoking rate over the 4-week nondemand phase and over the 8-week program. Health Locus of Control Scale scores were not found to have a significant influence on the relative reactivity of self-monitoring in the present context.

Correlations between the self-report measures that were administered at the periods

already described and the mean daily smoking rates revealed moderately positive coefficients: prenondemand phase motivation to quit and weekly smoking rate, $r(38) = .40$, $p < .01$; postnondemand phase motivation to quit and weekly smoking rate, $r(35) = .39$, $p < .01$; Health Locus of Control score and strength of belief in the health hazards of smoking ($r(38) = -.32$, $p < .05$); and prenondemand phase motivation to quit and strength of belief in health hazards of smoking, $r(38) = .52$, $p < .001$.

Discussion

The results show that all groups significantly decreased their smoking rates across the 4-week nondemand self-monitoring phase of the study. Self-monitoring nicotine content, however, resulted in significantly greater reductions in smoking than self-monitoring of the number of cigarettes smoked. Smoking rates continued to decline during the ensuing 4 weeks of a standard behavioral self-control program, with the groups that self-monitored nicotine showing marginally significant decreases in smoking compared to those that monitored number of cigarettes at posttreatment. Presumably a floor effect may be noted as all subjects approached their goal of abstinence during the treatment phase. Providing subjects with information on the health hazards of smoking did not in itself have a significant effect on smoking.

The significant decrease in smoking over time in the groups that self-monitored the number of cigarettes smoked is consistent with the findings of Karoly and Doyle (1975) and McFall and Hammen (1971). As in those two studies, subjects in the present investigation were motivated to quit smoking. McFall (1970), who reported an increase in smoking as a function of self-monitoring the number of cigarettes smoked, studied smokers who may not have been motivated to modify their cigarette smoking. Lipsinski, Black, Nelson, and Ciminero (1975) demonstrated that self-monitoring decreased smoking only in those subjects who were motivated to reduce their smoking compared to nonmotivated subjects. The failure of the locus of control measure to predict outcome is consistent with the majority of findings in the treatment of smoking (Danaher, 1977) and obesity (Tobias & MacDonald, 1977).

The significantly greater reactivity resulting from the self-monitoring of nicotine content compared to the number of cigarettes smoked emphasizes the importance of the specific nature of the target behavior in determining the reactivity of self-monitoring procedures. These data appear to represent a conceptual replication of the findings on self-monitoring in obesity (Green, 1978). As a determinant of reactivity, the specific manner in which the target response being self-monitored is functionally related to the ultimate reinforcing consequences of the behavior in question has been largely ignored in most conceptual and empirical analyses of behavioral self-control to date.

The present findings are consistent with existing explanations of the reactivity of self-monitoring procedures. The nonmediational model emphasizes that self-monitoring provides salient discriminative stimuli that signal the ultimate consequences of smoking (Rachlin, 1974). Nicotine content appears to be a discriminative stimulus that is more salient and hence more powerful in controlling behavior than number of cigarettes smoked. In the mediational model, self-monitoring leads to self-evaluation in terms of the individual's performance standards with consequent self-reinforcement for actions that are positively regarded and self-punishment for negatively sanctioned behaviors (Bandura, 1977; Kanfer, 1970). According to this explanation, self-monitoring nicotine content makes it harder for the subject to avoid a negative self-appraisal of continued smoking.

The fact that only self-monitoring and not the provision of health information exercised a significant main effect on smoking rates cannot be taken to imply that the valence of the target behavior is not a precondition for reactivity. Cigarette smoking, at least among subjects who are motivated to quit, has an intrinsic negative valence. Significant

changes in knowledge about health hazards of smoking (negative valence) were demonstrated for the information versus no-information groups. Although the two nicotine self-monitoring groups did not differ significantly, only the group combining nicotine self-monitoring and health information was significantly more effective in reducing smoking rates than the cigarette self-monitoring conditions. This result extends Kazdin's (1974a) and Sieck and McFall's (1976) findings that both self-monitoring and the valence that attaches to the target behavior are important elements in maximal behavior change.

One of the limitations of the present study is that the effects of providing health information alone were not evaluated. However, the evidence from smoking clinics that embody the basic components of the present health information approach, including advice, encouragement, and group support, indicate that such components are largely ineffective (Bernstein & McAlister, 1976). The present findings suggest that the efficacy of giving clients advice and information on the health hazards of smoking as is routinely done might be improved by the simple and inexpensive procedure of instructing clients to self-monitor the nicotine content of the cigarettes they smoke.

Neither a group that focused on nicotine without actually monitoring it nor a group not specifically instructed to self-monitor were included as controls. Consequently, the study may be viewed as one that compares the relative reactivity of different self-monitoring procedures rather than as one addressed to the "pure" or uncontaminated effects of self-monitoring per se. However, alteration of the target behavior being self-monitored produces differential reactivity in self-monitoring. It is unclear what information-processing mechanisms mediate these effects. One may speculate that altering the target behavior may change contextual connotations, associations with vivid imagery, or some other complex of cognitive, motivational, or attentional processes.

It appears that within the clinically relevant context of a smoking cessation program, differential reactivity can be induced as a function of altering the target behavior being monitored. But the most striking reactive effects took place during the pretreatment, nondemand phase of the study. It is therefore an open question how this reactivity is related to initial treatment efforts aimed at total abstinence or long-term maintenance of treatment produced gains. This study may be best viewed as one addressing a theoretical/conceptual issue that has clinical relevance rather than as one directly addressing implications for treatment.

The present study was not intended to be an evaluation of treatment outcome. Such a purpose would necessitate a more extended initial treatment effort followed by the use of behavioral strategies designed to facilitate generalization and maintenance of behavior change over a long-term follow-up. Among other questions requiring further research is whether the reactive effects of self-monitoring as observed in the present study are maintained over time. Fundamental to evaluating this question will be clients' adherence to self-monitoring procedures, and it must be kept in mind that adherence can be expected to vary according to the specific target behavior that is being monitored as well as when and in what manner the behavior is being monitored.

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