help manual emphasizing a doctor's prescribed program). These findings suggest that the degree of consistency between attributions for initial success and the orientation of the cessation approach can affect the probability of relapse.

Social Factors

Smoking Cues

Most exposure to smoking-specific cues is socially mediated—e.g., watching others smoke. Such exposures have been labeled "social contagion" (Shiffman and Jarvik 1987). Few studies have assessed social contagion directly. Many studies have, however, examined the effect of having a spouse, friends, or coworkers who smoke.

The literature on the effect of spouse smoking status is surprisingly contradictory. Several studies report moderate-to-large increases in the probability of relapse among subjects with a smoking spouse (Campbell 1983; Graham and Gibson 1971; McIntyre-Kingsolver, Lichtenstein, Merrellstein 1986; Tongas, Patterson, Goodkind 1976). Some studies, though, report no effect of spousal smoking (Horwitz, Hindi-Alexander, Wagner 1985; Garvey, Heinold, Rosner, in press; Swan et al., in press).

One possible explanation for the inconsistent findings is that the influence of spousal smoking is so strong that it often prevents initial cessation. This would cause the effect to be only sporadically observed in maintenance. The effects of spouse smoking status may also be complicated by interactions with social support. The risk incurred by having a smoking spouse may be reduced or eliminated if the spouse is supportive (Merrellstein, Lichtenstein, McIntyre 1983). This may be especially true if the spouse refrains from smoking in the presence of the subject, thereby resulting in fewer exposures to smoking cues.

The data on friend smoking are clearer. Several studies find that subjects who have more smokers among their friends are more likely to relapse (Eisinger 1971; Garvey, Heinold, Rosner, in press; Ockene et al. 1982; Gottlieb et al. 1981; Goldstein 1981). One study failed to replicate this effect (Swan et al., in press). Brandon, Tiffany, and Baker (1986) found that smokers having a lapse cigarette in the presence of other smokers progressed to regular smoking more quickly than did other lapsers. The most parsimonious explanations of these social contagion effects are that people with many smoking friends tend to experience more exposure to smoking cues and that cigarettes are likely to be more readily available to them.

Social Support

Social support can serve as a buffer to reduce the negative psychological effects of stressors (Cobb 1976; Cohen, Sherrod, Clark
Correlational studies have found that the level of perceived social support is related to smoking cessation and maintenance. Coppotelli and Orleans (1985), for example, examined the determinants of maintenance among women who recently quit smoking. They found that a measure of "partner facilitation" (problem solving, rewarding quitting, understanding, listening, and facilitating coping responses) accounted for 32 percent of the outcome variance at 6 to 8 week postcessation. General social support from spouses, as well as smoking-specific spousal support, has been related to smoking treatment outcome (Horwitz, Hindi-Alexander, Wagner 1985; Mermelstein et al. 1986; Mermelstein, Lichtenstein, McIntyre 1983; although see Glasgow et al. 1985).

Global Support

Global support has usually been assessed as perceived support. Using the Interpersonal Support Evaluation List (ISEL; Cohen and Hoberman 1983) to measure support, Mermelstein and coworkers (1986) found that greater perceived support (having someone to talk to about personal matters) predicted maintenance at a 3-month followup. However, the ISEL was unrelated to smoking status at 6 or 12 months, and the 3-month findings were not replicated in a second study by the same investigators (Mermelstein et al. 1986). As noted above, Coppotelli and Orleans (1985) found that women who reported receiving greater support from their husbands were more likely to maintain abstinence. There was no comparison group of male subjects.

Smoking-Specific Support

Several studies have examined the role of social support directed at smoking cessation. The most thorough investigations of specific support have been conducted by researchers at the University of Oregon, who developed the Partner Interaction Questionnaire (PIQ; Mermelstein, Lichtenstein, McIntyre 1983) to assess perceived helper behaviors. These investigators found that perceived helpfulness of partner behaviors was related to cessation and maintenance. The actual number of partner behaviors was not related to outcome; however, a measure of the character of the interactions was related. A cluster of partner behaviors labeled "Support and Encouragement" (e.g., expressing understanding or pride) was related to maintenance of abstinence. In contrast, a cluster of behaviors involving "Nagging and Policing" (Mermelstein, Lichtenstein, McIntyre 1983) predicted relapse. Subsequent studies using the PIQ have only partially replicated these findings.
Other studies using other measures have also yielded mixed results. In a large prospective study, Prochaska, DiClemente, and colleagues (Prochaska and DiClemente 1983; DiClemente and Prochaska 1985; Prochaska et al. 1985) reported that social support predicted continuing abstinence. However, several other research groups have failed to find evidence that smoking-specific support aids maintenance (Evans and Lane 1981; Ockene et al. 1982; Garvey, Heinold, Rosner, in press).

stress

Some studies have used the life events approach to the assessment of stress (Holmes and Rahe 1967). This technique asks subjects about major life events that have occurred since the subjects stopped smoking. Most studies have found little or no relationship between life stress events and relapse (Shapiro and Gunn 1985; Shiffman, Read, Jarvik 1985). This may be because life stress events are relatively uncommon.

Recent research on stress has begun to focus on more frequent and smaller-scale stressors, which Lazarus and colleagues (1981) and DeLongis and coworkers (1982) have called "Hassles." The Hassles Scale assesses the frequency and perceived severity of everyday stressors, such as having difficulties with coworkers or not having enough time for recreation. Swan and colleagues (Swan and Denk, in press; Swan et al., in press) found that hassles during the second month of abstinence only weakly predicted outcomes at 1 year. The effect of hassles was more reliable for men than for women.

A somewhat different approach to examining background stress was taken by Cohen and his colleagues, who developed and used the Perceived Stress Scale (PSS). The PSS measures perceived stress and demoralization without reference to particular events or sources of stress. Cohen and colleagues found that PSS scores did predict relapse and that they were strongly associated with daily cigarette consumption among recidivists.

Stress and coping theories of smoking imply that deficiencies in personal resources for coping with stress may enhance the risk of relapse (Wills and Shiffman 1985). Using the Ways of Coping checklist, Ashenberg (1983) assessed how subjects who had quit smoking coped with stress in situations that are often associated with relapse. There were no differences between relapers and abstainers in the kinds of coping reported, but abstainers reported using fewer coping strategies. The meaning of this finding is unclear. Abstainers could have experienced less severe stress or less severe threats to abstinence, and therefore needed fewer coping responses. Conversely, abstainer coping responses could have been more
effective, therefore mitigating the need for more coping. Also, when Ashenberg examined recidivists, stressful situations associated with coping were found to be less likely to lead to relapse than those not associated with coping.

Precipitating Factors

High-Risk Situations

A number of studies support the theory that initial smoking following cessation tends to occur in specific types of high-risk situations. Work by Marlatt and his associates (Marlatt and Gordon 1980, 1985) has identified craving/withdrawal, intrapersonal negative emotional states (e.g., frustration, boredom, and anxiety), interpersonal conflict situations, and social pressure, both direct and indirect, as common types of high-risk situations. Shiffman (1986c) and Baer and Lichtenstein (in press) clustered data on the precipitants of relapse crises and lapses.

Data from studies of relapse episodes confirm that smoking cues are often involved in smoking relapse. Several studies report the smoking of others in the immediate environment in one-half to three-quarters of all relapse episodes (Brandon, Tiffany, Baker 1986; Colletti, Supnick, Rizzo 1981; Baer and Lichtenstein, in press; Shiffman 1982, 1986c; Cummings, Jaen, Giovino 1985). Many of these same studies report that specific smoking stimuli (usually seeing someone smoking) are responsible for precipitating 24 to 32 percent of all relapses (Shiffman 1982, 1986c; Ossip-Klein et al. 1986; Shapiro, Ossip-Klein, Stiggins 1983). Studies also report that relapse crises in which someone else is smoking are more likely to result in a smoking episode and in a shorter interval between the initial slip and relapse (Brandon, Tiffany, Baker 1986; Ossip-Klein et al. 1986; Shiffman 1982).

Abrams and his colleagues (Abrams et al., in press; Chapter III) have recently published data suggesting that individual differences in reactivity to smoking cues may influence cessation and relapse. In retrospective and prospective studies, these researchers found that recidivists responded more strongly than successful quitters to verbally presented smoking situations or to observations of another smoking. Recidivists displayed more anxiety and showed greater heart rate responses. It may be that responses elicited by smoking stimuli (Sautet and Dittmar 1985) reflect conditioned responses to nicotine effects.

Other smokers serve not only as cues for smoking but as sources of cigarettes. In half of all relapse episodes, another smoker provides the cigarettes that are smoked (Colletti, Supnick, Rizzo 1981; Baer and Lichtenstein, in press; Cummings, Jaen, Giovino 1985). This does not imply that the smokers exert social pressure to smoke; in most
cases, the ex-smoker specifically asks for a cigarette (Brandon, Tiffany, Baker 1986).

Data on relapse episodes suggest that relapse also can be cued by other stimuli or activities that have become associated with smoking through contiguity, for instance, food, drink, or relaxation (Baer and Lichtenstein, in press; Brandon, Tiffany, Baker 1986; Ossip-Klein et al. 1986; Shiffman 1986b).

Studies of specific relapse episodes consistently suggest that stress and negative affect play major roles in relapse. Findings from many studies encompassing diverse samples reveal that the majority of relapse episodes are preceded by negative affect (Brandon, Tiffany, Baker 1986; Shiffman 1982, 1986b; Marlatt and Gordon 1980; Cummings, Marlatt, Gordon 1980; O'Connell and Martin 1987; Gregory 1984; Baer and Lichtenstein, in press; Ossip-Klein et al. 1986; Shapiro, Ossip-Klein, Stiggins 1983; Giovino et al. 1986; Shapiro 1984). In some studies, as many as 9 out of 10 subjects report negative affect (Coppotelli and Orleans 1985). The most frequently reported emotion is anxiety, but boredom, depression, and anger are also common.

Data suggest that the more severe the stress surrounding a temptation to smoke, the higher the likelihood of smoking. Shiffman, Read, and Jarvik (1985) report a significant linear relationship between stress and smoking in relapse crises. There are contradictory data as to whether lapses associated with negative affect are particularly likely to progress to full relapse (Brandon, Tiffany, Baker 1986; O'Connell and Martin 1987). In sum, momentary stress and distress are major factors in relapse episodes. It should be noted, however, that these studies involve retrospective accounts of relapse episodes.

The role of negative affect in relapse may change over time. Cummings, Jaen, and Giovino (1985) report that early relapse episodes are more likely to be precipitated by stress; later in abstinence, alcohol and other appetitive cues become more prominent.

Coping Strategies

Coping strategies can be used both to prevent (anticipatory coping) and to directly respond to (immediate coping) high-risk situations. In either case, the strategies used can be behavioral, consisting of responses that are outwardly visible (e.g., leaving a party where others are smoking, engaging in physical activities), or cognitive, consisting of internal responses such as thoughts or images.

One of the most commonly used and studied anticipatory coping strategies is stimulus control—the avoidance of stimuli associated with smoking. Research on this strategy shows mixed outcomes, yielding no definitive conclusions (Evans and Lane 1981; Horwitz,
Hind-Alexander, Wagner 1985; Prochaska and DiClemente 1983; DiClemente and Prochaska 1985). Data on the relative efficacy of cognitive and behavioral strategies weakly support the superiority of cognitive strategies. Evans and Lane (1981) report weak indications that successful maintainers were more likely to use cognitive techniques rather than behavioral ones.

Immediate coping has been assessed in studies that examined situations in which an ex-smoker was tempted to smoke. Studies of immediate coping with the temptation to smoke typically compare episodes in which smoking was averted with episodes in which relapse occurred. Shiffman (1982, 1984b, 1985) found that failure to perform any coping response was the single best predictor of smoking in a tempting situation, accounting for nearly a quarter of the variance in the outcomes of high-risk situations. This finding has been directly and indirectly supported in several other studies (Curry, Marlatt, Gordon 1987; Ossip-Klein et al. 1986; Shapiro, Ossip-Klein, Stiggins 1983; Sjoberg and Johnson 1978; Sjoberg and Samsonowitz 1978). These studies consistently show immediate coping to be effective in preventing smoking in a relapse-promoting situation. One problem with all of these studies, however, is retrospective bias. Subjects may introduce a self-justifying slant into their responses. Unfortunately, it may be virtually impossible to obtain prospective data on immediate coping.

Although there is no evidence that greater numbers of coping responses are more effective, there is evidence that it is better to use both cognitive and behavioral coping strategies when faced with a risk situation (Curry, Marlatt, Gordon 1987; Shiffman 1982, 1984b). Cognitive and behavioral coping are rather broad categories of responses. The relative efficacy of specific responses within those categories has also been examined in an attempt to identify effective and ineffective coping responses. Shiffman (1984b) examined the effectiveness of seven behavioral and eight cognitive coping strategies. Only one type of coping was not more effective than no coping: subjects who reported using self-punitive cognitions (berating oneself for being tempted to smoke) to cope were as likely to relapse as subjects who made no cognitive coping response. (See Glasgow et al. 1985, for parallel findings on cessation.) Self-punitive cognitions may diminish self-efficacy and engender negative affect, which in turn promotes smoking. Another finding from these comparative analyses was that subjects who reported "willpower" as a means of cognitive coping were significantly more likely to relapse (nearly half relapsed) than subjects who used other cognitive coping responses. Nevertheless, subjects who reported willpower fared better than subjects who made no cognitive coping response at all.

These two distinctions notwithstanding, the effectiveness of various coping responses was surprisingly uniform: 13 of the 15
responses were better than no response, but there were no significant differences among these 13 responses. Curry, Marlatt, and Gordon (1987) conducted a very similar set of analyses and arrived at a similar conclusion.

Several studies have examined whether individual differences in coping skill are associated with maintenance. The studies used similar analog methods to assess coping skill: subjects were presented with situations known to elicit desire to smoke, and their responses to these situations were rated. These studies used both retrospective and prospective analyses and had subjects respond either to written or role-played coping scenarios (Abrams et al. 1987; Davis 1983; Davis and Glaros 1986; Shiffman, Maltese, Jarvik 1982). Results of retrospective analyses showed that 6-month abstainers did not differ in coping skill from recidivists (Abrams et al. 1987; Shiffman et al. 1985). Prospective studies also yielded little evidence that coping skill protects against relapse. Such studies have found no relationship between skill level and relapse likelihood, although there was evidence that high-skill subjects took longer to relapse (Abrams et al. 1987, in press; Davis 1983; Davis and Glaros 1986). Also, Davis and Glaros (1986) showed that a skill-based treatment increased the level of smoker coping skills assessed immediately posttreatment but did not enhance smoker followup performance.

Abstinence Violation Effect

Marlatt and Gordon (1980, 1985) define the Abstinence Violation Effect (AVE) as an attributional construct that mediates the transition from an initial lapse to a full-blown relapse. Curry, Marlatt, and Gordon (1987) found that individuals who smoked but did not return to regular smoking ("slippery") reported significantly greater AVEs than those who relapsed following an initial slip. Brandon, Tiffany, and Baker (1986) reported that only one-third of their subjects (N=72) used any coping response after a lapse and that the occurrence of coping was unrelated to relapse probability or speed of relapse.

Summary and Conclusions

1. Tobacco dependence can be treated successfully.
2. Effective interventions include behavioral approaches and behavioral approaches with adjunctive pharmacologic treatment.
3. Behavioral interventions are most effective when they include multiple components (procedures such as aversive smoking, skills training, group support, and self-reward). Inclusion of too
many treatment procedures can lead to a less successful outcome.

4. Nicotine replacement can reduce tobacco withdrawal symptoms and may enhance the efficacy of behavioral treatment.
References


KLESGES, R.C., MEYERS, A.W., HANSON, C.L., ECK, L. Smoking cessation and weight gain in males and females. Poster to be presented at: The Association for the Advancement of Behavior Therapy, Boston, Massachusetts, 1987.


