Best, Owen, and Trentadue (1978) compared satiation and rapid smoking in the context of self-management training. Subjects rehearsed possible alternatives or coping strategies for each anticipated problem situation. Suggested techniques were applied on an individualized basis and included relaxation, deep breathing, contingency contracting, social support, stimulus control, and behavioral rehearsal. The overall result with 60 subjects was 47 percent abstinence at 6-month followup.

Powell and McCann (1981) achieved successful results with a combination of lectures, self-control techniques, and aversive smoking. Aversive smoking consisted of rapid puffing without inhalation and holding the cigarette in an awkward position. Efforts were made to increase the unpleasantness of the procedures by providing ashtrays that were full of cigarette litter, dipping cigarettes in a bitter-tasting solution, and showing slides of diseased organs. Subjects were randomly assigned to one of three maintenance conditions: a 4-week support group, 4 weeks of telephone calls between subjects, or a no-contact control group. Results for the 51 subjects at 1-year followup were impressive, although there were no significant differences between conditions. The support group and the no-contact controls achieved 65 percent abstinence, and telephone contact subjects achieved 59 percent abstinence.

Hall, Rugg, and colleagues (1984) assessed two levels of relapse prevention (skills training versus discussion control) and two levels of aversive smoking (6- vs. 30-sec inhalations) in a 2-by-2 factorial design. Of 135 subjects recruited, 123 completed treatment. Of 14 treatment sessions, 8 included aversive smoking. Six sessions were devoted to relapse prevention. Specific skills training components included cue-produced relaxation, commitment enhancement, and rehearsal of commonly experienced relapse situations. Subjects assigned to the skills training condition were more likely to report use of coping skills. One-year abstinence outcomes were as follows: 52 percent for 6-sec inhalations/skills training, 39 percent for 30-sec inhalations/skills training, 34 percent for 6-sec inhalations/discussion, and 26 percent for 30-sec inhalations/discussion. Skills training was superior to the discussion control at the 1-year followup (dropouts were excluded from this analysis). No differences were observed between the 6- and 30-sec smoking procedures.

Lando (1977) compared a comprehensive treatment procedure (satiation, contingency contracts, group support, booster aversion) against a satiation control. Subjects were seen in small groups. All subjects attended six treatment sessions over a 1-week period. Subjects assigned the comprehensive intervention attended an additional seven sessions during 2 months of maintenance. Results at 6-month followup indicated 76 percent abstinence for the comprehensive procedure and 35 percent abstinence for the satiation

condition. However, it should be noted that these results were based upon a total of only 34 subjects and 2 small groups per condition.

Lando (1981) assigned 99 subjects to a 2-stage treatment (aversion and maintenance) similar to that employed in his 1977 study or to a 3-stage procedure that also included fear appeals and stimulus control. Subjects were in addition randomly assigned to intensive or minimal contact conditions. Efforts to implement a maintained reduction procedure among nonabstinent subjects were unsuccessful. One-year followup results favored the two-stage intensive contact procedure. The group of subjects in this condition achieved a 46 percent abstinence rate whereas subjects in each of the other conditions attained abstinence rates less than 20 percent. In a 3-year followup, Lando and McGovern (1982) again found 46 percent abstinence among subjects in the two-stage intensive treatment (continuous abstinence from the end of treatment in this condition was 33 percent).

Elliott and Denney (1978) developed a package treatment encompassing self-reward and punishment, cognitive restructuring, applied relaxation, behavioral rehearsal, systematic desensitization, emotional role playing, covert sensitization, and rapid smoking. This comprehensive program was compared against rapid smoking by itself and two control conditions. Six-month followup results (N=60) indicated a significant effect in favor of the package treatment. Subjects in this condition achieved a 45 percent abstinence rate as opposed to 17 percent for rapid smoking by itself, 12 percent for a nonspecific control, and 0 percent for an untreated control.

Erickson and colleagues (1983) assigned subjects to either rapid smoking or to a less-aversive rapid-puffing procedure. These subjects also were assigned behavioral counseling which included training in problem-solving strategies. A comparison group underwent only behavioral counseling, without any aversive smoking. Results favored the combination of rapid smoking and behavioral counseling. At 1-year followup 70 percent of rapid-smoking subjects and only 33 percent of rapid-puffing and 14 percent of behavioral counseling subjects reported abstinence. A total of only 26 subjects were included in this study.

Tiffany, Martin, and Baker (1986) assessed full-scale rapid smoking with full counseling, truncated rapid smoking with full counseling, rapid puffing with full counseling, and full-scale rapid smoking with reduced counseling. Eighty-two subjects completed treatment. During behavioral counseling, subjects learned to anticipate potential problem situations and to plan coping strategies for these situations. The full-scale rapid-smoking and rapid-puffing procedures included three trials per session. Truncated rapid smoking consisted of only one trial per session. Reduced counseling emphasized support and encouragement rather than specific behavioral

procedures. Six-month followup results favored the full-scale rapid-smoking and rapid-puffing conditions combined with full-scale counseling (59 and 55 percent abstinence, respectively). Either truncated rapid smoking or reduced counseling appeared to detract from effectiveness (35 percent of subjects in each of these conditions were abstinent at 6-month followup).

As noted in the section on methodological issues in treatment (below), many multicomponent treatments are based on clinical intuition or on the effectiveness of a treatment when used by itself and few are based on an explicit theory or model of addiction and behavioral change. Moreover, few multicomponent evaluative studies contain sound process measures that tap processes theoretically linked to particular interventions. Therefore, even though multicomponent treatments are often effective, the basis of their efficacy is little understood.

It is unclear why particular treatment elements are effective when combined. Perhaps these elements interact so that an individual who would not be especially helped by one treatment is aided by the combination. Perhaps the treatment components are additive because their individual effects are largely independent. To investigate the nature of multicomponent treatment effects, researchers might strive to develop experimental designs that are sensitive to particular components and to determine whether these reflect interactive effects when auxiliary treatments are added. It is recognized, however, that required numbers of subjects and statistical power issues often render this type of approach impractical. Furthermore, isolation of very precise or subtle treatment elements, as opposed to major differences, appears both impractical and unlikely (Lando 1982).

Some multicomponent treatments contain elements that are labeled as "maintenance" and are delivered during the postcessation, followup interval. These are based on the notion that extending therapist contact or skills training in the followup interval will prolong treatment gains. Evidence is mixed as to whether such maintenance treatments significantly enhance the long-term effectiveness of complete, multicomponent programs (Brandon, Zelman, Baker, in press).

Although multicomponent programs are often very effective, more is not always better (Lando 1981). Inclusion of too many procedures may overwhelm subjects and thereby reduce adherence to treatment. A point of diminishing returns may be reached by simply adding additional components to an already complex intervention. Combinations of multicomponent behavioral treatment and pharmacologic intervention may be promising for highly dependent smokers, especially for those who have been unable to achieve even short-term abstinence despite repeated attempts.

Other Treatment Strategies

Hypnosis

The usual intent of hypnosis is to increase client motivation or ability to quit smoking through posthypnotic suggestions. The most commonly used posthypnotic suggestions are variations of those originated by Spiegel (1970): (1) smoking is a poison to your body; (2) you need your body to live; and (3) you owe your body this respect and protection (Berkowitz, Ross-Townsend, Kohberger 1979; Hyman et al. 1986; Javel 1980; Perry, Gelfand, Marcovitch 1979). Suggestions may also involve problem-solving techniques (Frank et al. 1986; Javel 1980), review of the client's history of smoking (Javel 1980), desensitization to environmental cues (Wagner, Hindi-Alexander, Horwitz 1983), and an assortment of other elements (Katz 1980). Despite the variety of possible hypnotic procedures, some research reports fail to describe the procedure used (Lambe, Osier, Franks 1986; Schubert 1983). Hypnosis might most usefully be applied to the small percentage of the population that is highly susceptible to hypnotic induction. Some individuals are essentially unresponsive to hypnosis, whereas others evidence varying degrees of susceptibility. Individual differences in hypnotic susceptibility have in fact influenced outcome (Perry and Mullen 1975; West 1977), although this has not been reported by all investigators (Mott 1979).

No significant outcome differences were found when posthypnotic suggestions were compared with suggestions without hypnosis (Javel 1980), with suggestions after relaxation (Schubert 1983), with focused smoking or an attention placebo control condition (Hyman et al. 1986), or with behavior modification or health education interventions (Rabkin et al. 1984). Most studies have found hypnosis to be superior to no-treatment control groups, although Lambe, Osier, and Franks (1986) found no such difference. Followup abstinence rates reported for hypnosis in recent studies have ranged from less than 4 percent (Perry, Gelfand, Marcovitch 1979) to 60 percent (Javel 1980), with a mean of approximately 28 percent. These figures may be spuriously high because several studies reported less than 6 months of followup and most relied exclusively on subject self-report.

There is little evidence that hypnotic induction per se facilitates smoking cessation and maintenance above and beyond the effects of other treatment components (including the posthypnotic suggestions themselves) (Holroyd 1980; Katz 1980).

Acupuncture

Acupuncture involves the use of needles or staple-like attachments and commonly is given at the ear either by press needle or staple puncture. Acupuncture has gained popularity over the past 10 years (Schwartz 1987). There are few carefully controlled evaluations of

this procedure for smoking cessation. Many published reports have suffered from serious methodological shortcomings (e.g., lack of control conditions, short or nonexistent followup periods, failure to include data from all treated subjects). Six studies have compared acupuncture at the "correct" site for smoking cessation against an "incorrect" or sham site. In only one study (MacHovec and Mann 1978) was the correct site significantly superior to the sham site. As with hypnosis, most evaluations of acupuncture have relied exclusively on self-reports. At this point, there is little evidence that acupuncture relieves withdrawal symptoms or promotes smoking cessation. A combination of acupuncture and supportive counseling or skills training may be more effective (Schwartz 1987).

Treatment of Special Smoker Populations

Recognition of smoking as a dependence-producing behavior leads to important implications in treating several populations of smokers including women, blacks, and Hispanics. Current trends (Appendix A) indicate that the burdens of smoking in the future may be disproportionately felt by lower socioeconomic and minority population groups. For treatment to have optimal impact, it must meet the needs of smokers from diverse circumstances. Presently, the vast majority of those who avail themselves of formal intervention are white and are from relatively advantaged socioeconomic backgrounds.

It is not obvious that interventions for special populations should differ substantially from those that are currently available. There are indications based on smoking patterns and environmental and social factors that suggest the importance of tailored intervention. A great deal more research is needed, however. At this point, for example, it is unclear whether self-help treatment manuals oriented to specific target groups are preferable to more general manuals. Currently there are almost no materials or programs prepared especially for blacks or Hispanics. If the needs of lower SES and minority smokers are not met, the trend for smoking to be disproportionately concentrated among these groups is likely to continue. Considerations of treatment for the dependent smoker are not complete without substantial attention to issues of application and dissemination, especially to smokers not being served by current interventions.

Applying Smoking Interventions to Women

Sex Differences in Cessation and Relapse Rates

Trends in cigarette smoking among men and women in this century have followed roughly similar curves, except that increases and decreases in smoking prevalence among women have lagged 15

to 30 years behind rates for men (Harris 1983; US DHEW 1980; Appendix A). Recent declines in overall smoking prevalence are attributed to lower initiation rates among teenage males and higher cessation rates among adult males (Remington et al. 1985). The percentage of former smokers in the male population has increased more dramatically than the percentage of former smokers in the female population (Appendix A). Jarvis (1984) adjusted cigarette cessation rates in Britain and in the United States to reflect the proportion of males who switched from smoking cigarettes to smoking pipes and cigars. After this adjustment, sex differences in cigarette cessation rates disappeared for individuals under age 50.

Several recent, well-controlled prospective evaluations of cigarette cessation programs found no differences in the proportions of women and men who achieved initial cessation and/or long-term maintenance (Curry 1986; Gritz 1982; Hall, Ginsberg, Jones 1986). The question of whether previously observed gender differences in cessation and relapse rates (the magnitude of which is often small) reflect real and stable sex differences, historical effects true only in older smokers, or statistical artifacts due to analytical limitations is not resolved.

Motivation to quit. In one of the few studies addressing gender differences in motivation to quit, Curry (1986) found that successful male and female abstainers did not differ in their overall reasons for quitting (e.g., "Smoking is inconsistent with my commitment to good health"). However, women in Curry's (1986) study differed significantly from men on questions related to four more specific subdimensions of motivation: self-determination ("I will like myself better"), reinforcement ("My hair and clothes won't smell"), influence of significant others ("I can get praise from people I am close to [for quitting]"), and social consequences ("Smoking is less socially acceptable"). Perhaps these more specific reasons for quitting should be considered in tailoring the content of smoking treatments to female subjects.

Education. The personalization (perception of the personal relevance) of abstract information has been shown to be an important aspect of behavioral change in general (Mahoney 1974) and of health-related behavioral change in particular (Ben-Sira 1982; Schinke and Gilchrist 1984). Available evidence suggests that many women may not fully be aware of some important gender-specific health consequences of smoking (Shiffman 1986b; Sorensen and Pechacek 1987). Adolescent women in particular often either are not well informed or choose to ignore information on the harmful effects of smoking during pregnancy (Simms and Smith 1983; Stewart and Dunkley 1985). It may be useful to develop educational campaigns that publicize the gender-specific risks of smoking.

Information that might be used in such educational campaigns comes from studies of important adverse interactions between smoking and female physiology, especially estrogen-related processes. Several studies have found a positive association between cigarette smoking and early menopause (Baron 1984; Willett et al. 1983), estrogen-related postmenopausal osteoporosis and associated fractures (Daniell 1976; Paganini-Hill et al. 1981), and invasive cervical cancer (Brinton et al. 1986).

Social values and beliefs. Cigarette smoking is a multidetermined behavior shaped by both personal and environmental variables (Chassin, Presson, Sherman 1985; Jones and Battjes 1985). The bulk of research on smoking has assumed that the developmental pathways leading to cigarette use and later dependence are the same for males and females. Several lines of recent research suggest that this assumption is overly simplistic (Barton et al. 1982; Baumrind 1985; Ensminger, Brown, Kellam 1982; Gritz 1982; Yamaguchi and Kandel 1984). The developmental and social dynamics that propel female adolescents into smoking may differ from those operating on young males. Several studies suggest that female smokers appear attracted to cigarette smoking by a need to identify with a particular social image (Gritz 1982, 1984; Jacobson 1982; Mausner and Brandspiegel 1985). Studies of advertising influence show that women, more than men, choose cigarette brands for image reasons (Bergler 1981; Fisher and Magnus 1981). Cigarette smoking today is often associated in the media with independent women who are not only sexually desirable (and slender) but also successful in traditionally male activities (Baker, Dearborn et al. 1984; Godley, Lutzker, Lamazor, Martin 1984). Reliance on cigarettes for bolstering an important, self-selected social image may make some women resistant to educational messages on the health consequences of smoking.

Another factor bearing on women's use of cigarettes for social image reasons involves body size and weight control (Gritz 1985; Jacobson 1982; US DHEW 1980). Data from junior high students suggest that even at young ages females more than males are interested in cigarettes as a weight control aid (Charlton 1984; Chapter VI).

Achieving Abstinence

Weight gain. Women's fear of weight gain has been widely observed (US DHEW 1980). Some animal data (Grunberg, Bowen, Winders 1986; Grunberg, Winders, Popp 1987; Levin et al. 1987) as well as preliminary results from a study with human subjects (Klesges, Meyers et al. 1987) suggest that females are more likely than males to gain weight following removal of nicotine. In contrast, Hall, Ginsberg, and Jones (1986) found that although all subjects gained weight after achieving abstinence, weight gain was no more

likely to cause female subjects than male subjects to relapse (Chapter VI). More studies are needed to determine whether fear of weight gain in the early stages of cessation is a more powerful obstacle for women than is actual weight gain later in the cessation process.

Stress management. Social, psychological, and epidemiological studies consistently report the greater importance of cognitive appraisal processes and monitoring of internal states and feelings on the part of females compared with males (Blechman 1984). Several studies have characterized women as negative-affect smokers—i.e., individuals who smoke in response to emotional discomfort and for purposes of tension reduction (Brunswick and Messeri 1984; Christen and Glover 1983; Dembroski 1984; Livson 1985; Mitic, McGuire, Neumann 1985; Rust and Lloyd 1982; US DHEW 1980). Other researchers have found that negative-affect smokers grow more reliant on cigarettes than do smokers who respond to social or external stimuli (Ockene et al. 1981; Pomerleau, Adkins, Pertschuk 1978). In current cessation studies, female subjects, compared with male subjects, have reported more stress during the quit process (Abrams et al. 1987) and more concern about finding alternatives to cigarettes for coping with stress (Abrams et al. 1987; Moreton and East 1983; Sorensen and Pechacek 1987; Chapter VI).

Social support. Women, more often than men, report a preference for interacting and learning in settings that involve close, informal, personal, dyadic, or small-group interactions (Brody 1987; Glynn, Pearson, Sayers 1983; Grady, Brannon, Pleck 1979; Linehan 1984). Both the quantity and the quality of women's participation increase in groups composed solely of women (Burden and Gottlieb 1987; Linehan and Egan 1979; Gambrill and Richey 1986). Gritz (1982) concluded that women are more successful in programs that provide social support and individualized therapist-client contact, and less successful in programs in which such support is absent or when external environmental supports are lacking. Data continue to indicate the importance of social support (and partner support in particular) for maintenance of smoking cessation among women (Coppotelli and Orleans 1985; Sorensen and Pechacek 1987).

Smoking Cessation Initiatives for Black Americans

Black Americans constitute the Nation's largest minority group, making up 12 percent of the population, and have the highest smoking rate of the major U.S. ethnic/racial groups; 34.8 percent of all black American adults smoke, compared with 29.7 percent of non-Hispanic whites and 25.7 percent of Hispanic adults (Appendix A). Blacks also suffer the Nation's highest rates of mortality and morbidity from cardiovascular diseases and cancer, including coronary heart disease and lung cancer (Cooper and Simmons 1985; US DHHS 1985, 1986). Moreover, smoking represents an especially

serious health risk for blacks, given the disproportionate incidence of infant mortality and low birth weight, hypertension, diabetes, and hazardous occupational exposures within the U.S. black population (US DHHS 1985). To date, relatively little research has been done to clarify smoking/quitting patterns and determinants among black Americans or to test smoking cessation interventions in black populations.

The 1985 Cancer Prevention Awareness Survey (US DHHS 1987) found that blacks were less likely than the general public to report hearing or reading about cancer prevention in the preceding 6 months, and were less likely to view tobacco use as a cancer risk. There is also evidence that blacks have less belief in personal control over health outcomes and disease, particularly cancer (Deniston 1981; Snow 1983; US DHHS 1987).

Sociodemographic Factors

The sociodemographic correlates of smoking status among black Americans are similar to those for the U.S. population as a whole: these include lower income, lower education levels, lower occupational status, unemployment, being male, and being unmarried (never married, separated, or divorced) (Eisinger 1971; Marcus and Crane 1987; Orleans et al. 1987; US DHHS 1985; Warneke et al. 1978).

Restricted Health Care Access

More limited access to health care, particularly to preventive health services, may also play a role in the higher black smoking rate (Eisinger 1971; Green 1975; Rogers and Shoemaker 1971; US DHHS 1985; Warneke et al. 1978). Fewer blacks (54 percent) than whites (70 percent) report a physician's office as their regular source of care, and twice as many blacks as whites say they receive their regular care from hospital outpatient clinics and emergency rooms or public health clinics (where continuous care and preventive health services are less likely) (US DHHS 1985). Therefore, it is not surprising that the 1985 National Health Interview Survey (NHIS) found fewer adult black smokers (33 percent men, 43 percent women) than white smokers (40 percent men, 47 percent women) reporting medical advice to quit smoking (Marcus and Crane 1987).

Social Norms and Advertising Influences

Peer and family modeling appears to play the usual role in the initiation and maintenance of smoking as well as in smoking cessation (Orleans et al. 1987; Warneke et al. 1978). However, the combination of a higher smoking rate among blacks and a pervasive, well-financed, black-focused tobacco advertising campaign may lead

to stronger smoking norms within the black community (Cooper and Simmons 1985; Cummings, Giovino, Mendicino 1987; Davis 1987).

Determinants of Quitting Motivation and Success Among Black Smokers

Factors influencing quitting motivation and success among black smokers appear to be similar to those among smokers in general, including beliefs in smoking-related health harms and quitting benefits; personal relevance of the health threat; a greater number of sources of support and communication about smoking health risks and quitting; the extent to which family, friends, and health professionals provide personal information about smoking risks; personal medical advice to quit; self-mastery motivation; past efforts to quit or cut down; degree of tobacco dependence; and primary group social supports for quitting and nonsmoking (Eisinger 1971; McDill 1975; Orleans et al. 1987; Pechacek and Danaher 1979; Prochaska and DiClemente 1983; Warneke et al. 1978). Again, however, considerably more research is needed.

Smoking and Quitting Patterns Among Black Americans

Although black smokers smoke fewer cigarettes per day than white smokers, they smoke brands with higher tar/nicotine yields, especially menthol brands (Friedman, Sidney, Polen 1986; Appendix A). The 1981 NHIS showed that 65 percent of black smokers smoked brands with 1.1 mg or more of nicotine, in contrast to only 35 percent of white smokers, and that 67 percent of black smokers smoked menthol cigarettes, in contrast to only 26 percent of white smokers. In fact, it has been estimated that three high-nicotine menthol brands account for more than 60 percent of cigarettes purchased by blacks (Cummings, Giovino, Mendicino 1987). Menthol additives may pose additional health risks (Cummings, Giovino, Mendicino 1987); these additives could conceivably influence puffing patterns (e.g., by reducing the perceived "harshness" of the tobacco) so as to heighten nicotine delivery or smoking risks (e.g., by enabling the smoker to tolerate inhaling more often or more deeply or to smoke the cigarette to a shorter length). However, to date no studies that address this issue have been published. National survey data (US DHHS 1985) suggest that black smokers attempt to quit at the same rate that white smokers do. However, blacks appear to be less likely to remain abstinent (Appendix A). Quitting barriers faced more often by blacks include the same sociodemographic factors that explain their higher smoking rate, including the greater life stress and more limited resources associated with lower SES.

Quit-Smoking Treatments

Quitting methods. A recent survey of black ex-smokers showed that like U.S. ex-smokers as a whole, the vast majority had quit "on their own": 9 in 10 said they relied on "willpower," and only 1 in 10 reported using formal treatment programs, self-help guides or aids, or nicotine polacrilex gum (Orleans et al. 1987). There are, to date, no published data on the extent to which black and white U.S. smokers differ specifically in their access to, or use of, quit-smoking services and resources.

Sources/treatment agents. Physicians and other health care providers are powerful sources of quit-smoking assistance (Orleans 1985) and may be especially important sources for black Americans. In the 1985 Cancer Prevention Awareness Survey (US DHHS 1987), blacks reported more often than the general population that they would be very likely to follow a doctor's advice about ways to reduce cancer risks (US DHHS 1987).

Messages/methods. It is currently unclear whether black smokers would benefit any more or less than other groups from generally effective quit-smoking strategies and treatments. When outreach has assured equal black-white access to treatments and information (broadly defined in terms of recruitment efforts, location, affordability, appeal, and readability), outcomes for black and white smokers have been similar. For instance, Windsor and colleagues (1985) offered clearly worded pregnancy-focused self-help materials on quitting to women in public health maternity clinics and found no differences in quit rates between black and white participants of similar SES. High-coronary-risk black men assigned to the Special Intervention of the Multiple Risk Factor Intervention Trial (MRFIT) achieved 6-year quit rates (43 percent) essentially comparable to those of white participants (46 percent) despite lower SES (Connett and Stamler 1984). On the other hand, preliminary unpublished results from several ongoing trials suggest that interventions developed for the general population may not be appropriate for or acceptable to lower SES minority smokers.

Channels/delivery modes. Church groups, fraternal organizations, and other groups within the black community have a unique role to play in bringing effective programs and resources to the attention of smokers and to provide support needed for compliance (Eng, Hatch, Callan 1985; Orleans et al. 1987). Besides improving treatment accessibility, these organizations have the potential to provide ongoing assistance and support for quitting efforts and nonsmoking maintenance. Eng, Hatch, and Callan (1985), for instance, describe working through black churches in rural North Carolina to offer smoking cessation, weight control, diet modification, and stress management health education and behavioral change programs. Lay health advisers were recruited to work with local professionals to

organize church-based health fairs and to provide screening and referral on an individual basis.

Interventions for Smoking Cessation Among Hispanics

As the most rapidly growing ethnic group in the United States, Hispanics have caught the attention of demographers, social scientists, and health planners, yet relatively little is known of their smoking behaviors or responses to various intervention and treatment approaches. There is recent evidence (Davis 1987) that cigarette advertising is increasingly targeted to specific groups and that Hispanics have become a major focus of sophisticated marketing approaches.

Prevalence

Smoking prevalence among Hispanic males is comparable to that among white males and considerably less than that among blacks. Smoking among Hispanic women, in contrast, is considerably lower than smoking among either white or black women (Marcus and Crane 1985). Hispanics consume considerably fewer cigarettes per day than do whites. Heavy smoking among Hispanics is relatively infrequent (Marcus and Crane 1985, 1987; Samet et al. 1982; Stern et al. 1975).

Data from the 1985 Current Population Survey indicate substantial differences in smoking status by Hispanic subgroup. More Puerto Ricans reported smoking than did other subgroups (Mexican-Americans, Cubans, and Central and South Americans). Caution is needed in interpreting these data as they are based on limited numbers of respondents. Marcus and Crane (1985) reported that the pattern of high smoking prevalence among Hispanic men and relatively low prevalence among Hispanic women held true across a number of Hispanic subgroups. Overall, the data suggest considerable ethnic diversity within the Hispanic population. Diversity in smoking prevalence among Hispanics also has been found in the Hispanic Health and Nutrition Examination Survey (HHANES) conducted between 1982 and 1984 (Appendix A). Cultural differences among divergent Hispanic groups may need to be considered in the design and content of treatment programs.

Smoking Antecedents

Markides, Coreil, and Ray (1987) used data from a three-generational study and found that smoking behavior among younger Mexican-Americans was positively correlated with that of their middle-aged parents. This association was stronger for women. In a study of Mexican-American high school students who were identified as potential school dropouts, Bruno and Doscher (1984) found more

smokers in this group than among other students. These researchers found that 56 percent of their survey population of 78 potential dropouts had increased their cigarette consumption in the previous year. Otero-Sabogal and colleagues (1986) reported that "positive social presentation" as a consequence of smoking was mentioned by Hispanics in their study group. Castro and coworkers (in press) state that smoking and other habitual behaviors do not occur in isolation, but are part of a lifestyle. Smoking has been identified by these authors and others as a "core unhealthy behavior" that is associated with other such behaviors as use of illicit drugs, alcohol abuse, driving while intoxicated, nonuse of seat belts, and a pattern of little aerobic exercise. However, on a test of knowledge about the health consequences of smoking, moderate-to-heavy cigarette smokers were the highest scorers, suggesting an intellectual awareness of the risks involved in their behavior.

Smoking Interventions

The only available study that specifically targeted Hispanics was reported by Wittenberg (1983). During a market survey for the "Healthy Mothers, Healthy Babies" campaign, focus groups were organized to gather information from minority women. Researchers held sessions with eight groups of black women and seven groups of Mexican-American women. The results of these sessions suggested that the women involved largely ignored health advice, including advice to quit smoking, believing that the negative consequences would affect the mother and not the baby. Wittenberg (1983) found that the physician was considered the most credible source of health information but that family and friends were also important sources of information, which sometimes was in conflict with professional advice. Mexican-American women cited a paucity of Spanish-speaking health providers, and both minority groups stressed the need for such providers to have a better understanding of dietary preferences and traditional cultural patterns to more adequately serve pregnant minority women. The roles of the family, the Catholic Church, and the Spanish language have been said to be at the heart of the cultural identity of Hispanics in the United States (Guernica and Kasperuk 1982; Perez-Stable 1987). These influences have not been systematically assessed or harnessed in the design of smoking intervention programs for Hispanics.

Research addressing other ethnic groups is virtually nonexistent.

Methodological Issues in Treatment Study Design and Evaluation

Since the late 1970s, researchers and theoreticians have made progress in developing theoretical comparison strategies in evaluating pharmacologic and behavioral treatment interventions. This has

gradually resulted in the use of more sophisticated analytic comparisons in at least a few studies (Brandon, Tiffany, Baker 1987; Hall, Rugg et al. 1984; Harackiewicz et al. 1987; Raw and Russell 1980; Tiffany, Martin, Baker 1986). The development of specific measures and investigator adoption of theory-driven analytic strategies (Abrams et al. 1987; Davis and Glaros 1986; Erickson et al. 1983; Hall, Rugg et al. 1984; Harackiewicz et al. 1987; Mermelstein, Lichtenstein, McIntyre 1983; Shiffman and Jarvik 1976; Tiffany, Martin, Baker 1986) should result over the next 10 years in a clearer understanding of therapeutic change processes. Integrated theoretical approaches in which treatment, subject, and context factors are considered simultaneously may prove especially fruitful.

A second major methodological concern is the typical smoking intervention study design. Most researchers, when they do use control or comparison treatments, merely pit one treatment against another, often with no clear theoretical basis. Some investigators systematically remove or add treatment elements largely on pragmatic grounds. Unfortunately, such experimental designs permit only weak inferences concerning the specific effective elements of treatment (McFall 1978).

Earlier reviews (Pechacek 1979) noted that the principal problem plaguing smoking treatment evaluation was that clinical outcomes were typically inferred from data of suspect validity. Previously, most long-term outcome data were based on client self-reports of smoking status, possibly supported by informant reports. Both self- and informant reports are vulnerable to biases that make them inadequate in research settings as sole measures of outcome (Glynn, Gruder, Jegerski 1986; Li et al. 1984; Murray et al. 1987). Fortunately, over the last 9 years biochemical verification of self-reports has become a more common practice, although it is by no means universal.

Carboxyhemoglobin estimates from breath samples and measurements of thiocyanate in urine, saliva, or plasma and of cotinine in saliva and serum have been used most frequently to assess smoking status. Carboxyhemoglobin has a relatively brief half-life and is affected by ambient CO, activity level, and some drugs (Ringold et al. 1962; Henningfield, Stitzer, Griffiths 1980). However, this measure is inexpensive and can provide subjects immediate feedback on an important health risk factor. Thiocyanate may remain elevated for up to 12 to 14 days after smoking cessation (Barylko-Pikielna and Pangborn 1968; Pettigrew and Fell 1973). Thiocyanate levels may be quite variable within individuals (Barylko-Pikielna and Pangborn 1968). Assays of thiocyanate are insensitive to low levels of smoking (Vogt et al. 1977) and are often poorly correlated with self-reported smoking rates or actual measures of puffing patterns (Abueg, Colletti, Rizzo 1986; Burling et al. 1985; Vogt et al. 1977). Further-

more, thiocyanate levels may be considerably affected by consumption of common foods (e.g., almonds, tapioca, cabbage, broccoli, and cauliflower; Bliss and O'Connell 1984). For these reasons, cotinine is a generally preferred assay. Cotinine, a major metabolite of nicotine, is detected above nonsmoker levels for up to 48 hr after a single cigarette is smoked (Zeidenberg et al. 1977). Cotinine levels may persist for up to 7 days after cessation of habitual smoking (Benowitz et al. 1983). Cotinine assays tend to be expensive, limiting their usefulness. Readings will not accurately reflect smoking in individuals who use nicotine polacrilex gum. Immediate feedback to subjects is not possible with thiocyanate and cotinine measures.

Biochemical assays do not provide complete information concerning posttreatment smoking status. Self-report, although not adequate when used alone, is a necessary measure. Also, when subjects are aware of the use of biochemical assays, their self-reports of abstinence agree well with assay results (Hall, Rugg et al. 1984; Hall, Sachs et al. 1984; Glynn, Gruder, Jegerski 1986; Raw and Russell 1980). However, other studies have found no improvement in the accuracy of reporting with the use of physiological measures (Bliss and O'Connell 1984).

Insufficient attention has been devoted to length and intensity of treatment as determinants of outcome (Chapter V). As noted previously, the vast majority of individuals who have quit to date have done so in the absence of formal intervention. Spontaneous remission among chronic drug users has been observed not only for tobacco but for opioids and alcohol as well (Chapter V). However, evidence of spontaneous remission does not justify a failure to treat chronic smokers who are (or who perceive themselves to be) unable to achieve abstinence on their own.

Changing social norms appear to be extremely significant in the recent decline in smoking prevalence (Appendix A). Public health approaches have the potential of reaching far larger numbers of smokers than do intensive clinical treatments, yet some individuals obviously are resistant to these normative influences. Many tobacco users do not appear responsive to minimal contact or community interventions. Sachs (1986) has argued that highly intensive clinical procedures may be cost-effective for certain populations of high-risk smokers (e.g., those who already have suffered myocardial infarctions). Some individuals persist in their tobacco use despite the presence of immediate life-threatening health problems related to their dependence.

Other issues with which the field still struggles are definitional, e.g., the operational definitions of abstinence and relapse. Studies that report abstinence rates during followup split on whether they require continuous abstinence from the end of treatment or merely abstinence at the point of followup. Abstinence levels can differ

substantially depending on which measure is used. Failure to follow a common practice in reporting outcome (or to provide sufficient information to allow independent calculations) substantially increases the difficulty of comparing success rates across studies (Bigelow and Ossip-Klein 1986).

The National Interagency Council on Smoking and Health formulated stringent standards for the evaluation of smoking cessation programs. Complete cessation including total abstinence from tobacco in all forms for a period of 1 year was defined as the primary criterion for success. Several major health agencies (the American Cancer Society, the American Heart Association, and the American Lung Association) have endorsed these standards. Biochemical validation of self-reported abstinence is not required in these guidelines. The guidelines fail to distinguish between an isolated "slip" and actual relapse in the definition of successful quitting (Ossip-Klein et al. 1986).

Many studies still fail to include enough subjects to permit adequate statistical power and to promote generalizability of results. Few cessation studies have used validity checks to determine the extent to which treatment manipulations actually were implemented effectively. This is especially important when counseling strategies are being compared (Hall, Rugg et al. 1984; Tiffany, Martin, Baker 1986). Counseling manipulations and therapist training and experience should be adequately described, and validity checks of counseling differences should be incorporated into the assessment plan. Selection of subjects represents another important issue (e.g., type of smoker, cigarette consumption, prior history of failures). Treatment outcome may be influenced substantially by the characteristics of the smokers assigned to intervention.

In sum, cessation research has made methodologically notable strides in that, in the best studies, outcomes are verified with multiple assays (including biochemical ones), the design and evaluations of treatments are now theory driven, improved therapy process measures are used, and a variety of specific pragmatic problems such as subject attrition have been reduced. These improvements are recent, however, and characterize a relatively few published studies.

Conclusions

Smoking treatment research has been marked by considerable progress since it was reviewed in the 1979 Report of the Surgeon General (US DHEW 1979), both in methodological sophistication and to a lesser extent in the consistency of success achieved by the best multicomponent cessation programs.

In contrast to the generally positive outcomes of multicomponent treatments, there is mounting evidence that no single intervention

constitutes a generally effective method. In the case of multicomponent treatment interventions, individual components should complement one another. Interventions that hold promise and deserve additional attention are low-aversion directed-smoking strategies, skill-training treatments, interventions that enhance the self-attribution of treatment success, and interventions that train individuals to obtain and use social support resources. Low-aversion smoking treatments are important because of their acceptability, ease of administration, and generally promising results when used with other treatment elements. Research on skills training should explore the extent to which enhanced clinical outcomes depend on the acquisition and actual use of specific smoking-relevant skills. Therapeutic manipulations that enhance self-attributions of success or self-efficacy estimates could have wide treatment applicability. The combination of increased knowledge and skills, self-efficacy, and social support should enhance treatment outcomes.

Investigators should make more explicit the relationship between theory and therapeutic manipulations, valid assessments should be tailored to tap processes implicated by theory in behavioral change, and greater sample sizes should be included in treatment evaluation studies. Individual differences may be important in assigning smokers to combined pharmacologic and behavioral treatment (Hughes 1986). Some smokers appear to resist pharmacologic intervention. Smokers who attribute their success to pharmacologic agents may be at increased risk for relapse when these agents are withdrawn (Davison and Valins 1969). Conversely, some smokers accept pharmacologic treatment but refuse behavioral approaches. Many of these refusals stem from required time commitments that the smokers view as excessive.

Dissemination of effective treatment strategies is critically needed. Considering the vast body of treatment literature that has accumulated, surprisingly little systematic transfer to community settings has occurred. Many treatment programs that are available (e.g., proprietary, public service) have not been subjected to rigorous evaluation. Furthermore, these programs often do not reflect recent laboratory findings. This is especially true for pharmacologic approaches. Very few applied programs adequately address nicotine replacement therapies or other potentially relevant pharmacologic adjuncts to treatment. Dissemination is especially lacking for minority and lower SES populations, which may have the greatest need for these types of services.

Relapse

As in many areas of clinical practice, therapeutic interventions have been developed and implemented in the absence of a complete

understanding of the processes being treated. Future development of smoking cessation treatments designed to maintain abstinence in the face of high relapse prevalence should benefit greatly from an expanded knowledge base that is being accumulated concerning the correlates and determinants of smoking relapse.

Research has shown that smoking cessation is a process involving several discrete stages. These stages include precontemplation, contemplation, decision, action, and maintenance (Prochaska and DiClemente 1983, 1985, 1986; DiClemente and Prochaska 1985; Prochaska et al. 1985; Velicer et al. 1985; Wilcox et al. 1985). This Section considers recent research on factors related to successful maintenance of nonsmoking once initial cessation has been achieved during the action stage. Studies of long-term outcomes in smoking cessation indicate that relapse, rather than maintenance, is the most prevalent outcome during this stage. Hunt and his colleagues (Hunt, Barnett, Branch 1971; Hunt and Matarazzo 1973) showed that over a wide range of treatments, relapse rates of 75 to 80 percent could be expected among smokers who achieved initial cessation (Figure 2, Chapter V). These findings have been replicated many times in recent treatment outcome studies (Schwartz 1987). It should be noted, however, that these relapse rates are based on single quit attempts. Cumulative long-term abstinence rates covering multiple quit attempts may be considerably better (Schachter 1982).

Defining Relapse

Given that relapse depends on the achievement of initial cessation, definitions of relapse must include a definition of cessation. In addition, many investigators distinguish between a "slip" or smoking one's first cigarette and a "relapse" or return to regular smoking (Brownell et al. 1986). The National Working Conference on Smoking Relapse recommended a duration of 24 hr of continuous tobacco abstinence to define initial cessation. A slip was defined as a "period of not more than 6 consecutive days of smoking following at least 24 hr of abstinence" (Ossip-Klein et al. 1986). Smoking beyond 6 consecutive days was then defined as a relapse. These definitions of quit episode, slip, and relapse are somewhat lenient. Many investigators require a longer period of initial abstinence (e.g., 48 hr or 1 week) for a quit episode and regard even a few smoking occasions as a relapse rather than a slip. Considerable data indicate that an initial slip is highly predictive of subsequent relapse (Brandon, Tiffany, Baker 1986; Ossip-Klein et al. 1986).

Conceptual Frameworks

Research on the relapse process has focused on two general areas: (1) identifying factors that predispose individuals to relapse or to successful maintenance and (2) identifying factors that precipitate or

immediately precede the return to smoking following initial success (Shiffman et al. 1986). Predisposing factors include characteristics of individuals and their environments that make them more or less vulnerable to relapse as they begin the maintenance process. Precipitating factors relate to the circumstances surrounding a specific relapse situation or smoking the first cigarette following a period of abstinence.

Social learning theory has provided a useful framework for much of the research on predisposing factors (Bandura 1977b; Brownell et al. 1986; Leventhal and Cleary 1980; Shiffman et al. 1986). From this perspective, the effects of environmental or behavioral elements on maintenance of nonsmoking are mediated by individual factors such as prior experience with smoking cessation and beliefs about the cessation process. In addition to personal demographic characteristics, predisposing variables examined that are consistent with this framework include smoking and quitting history, social factors (social support and the presence of smoking cues in the social environment), stress, and cognitive factors such as self-efficacy, outcome attributions, and perceptions about the consequences of quitting smoking (Chapter VI).

Marlatt and Gordon's model of the relapse process (Marlatt and Gordon 1980, 1985) has provided the foundation for much of the research on the circumstances associated with initial slips and suggests specific hypotheses regarding factors that mediate the transition from an initial slip to a full-blown relapse. This model proposes that initial smoking following a period of abstinence is likely to occur in certain types of high-risk situations. As suggested by the types of predisposing factors listed above, high-risk situations could include intrapersonal factors such as negative affect and severe withdrawal symptoms following a long history of heavy smoking. The first determinant of whether smoking occurs in a high-risk situation is whether the individual uses specific strategies to cope with the situation. Successful coping is assumed to lead to increased confidence in one's ability to maintain abstinence, thereby decreasing the probability of relapse. Failure to cope in the situation coupled with positive expectations about the effects of smoking can lead to an initial slip. The Abstinence Violation Effect (AVE) is proposed as the major mediating factor between an initial slip and a full-blown relapse. Defined as an attributional construct (Curry, Marlatt, Gordon 1987; Marlatt and Gordon 1985), the AVE is characterized by internal, stable, and global causal attributions for smoking the initial cigarette. Research on specific factors within these conceptual frameworks is reviewed below.

Predisposing Factors

Demographics

To the extent that demographic factors are related to initial cessation, the population of individuals who achieve cessation and are "eligible" for relapse is relatively homogeneous. It is not surprising, therefore, that the majority of studies that examined these variables have not found differences in relapse rates by socioeconomic status (Campbell 1983; Eisinger 1971; Evans and Lane 1981; Garvey, Heinold, Rosner, in press; Hirvonen 1983; Horwitz, Hindi-Alexander, Wagner 1985; Jacobs et al. 1971), age (Coppotelli and Orleans 1985; Cummings et al. 1985; Evans and Lane 1981; Hirvonen 1983; Horwitz, Hindi-Alexander, Wagner 1985; Jacobs et al. 1971), or gender (Eisinger 1971; Evans and Lane 1981; Shapiro and Gunn 1985; Horwitz, Hindi-Alexander, Wagner 1985). Exceptions to the findings for age include one study that found an inverse relationship (Garvey, Heinold, Rosner, in press) and two studies reporting a positive relationship between age and long-term success (Campbell 1983; Eisinger 1971). One study did report that males were more successful than were females at long-term maintenance (Hirvonen 1983).

Although women and men may be equally likely to relapse, data suggest that their return to smoking is precipitated by different factors. Hirvonen (1983) reports that men more frequently cited alcohol consumption and strong cravings as causes of relapse, whereas women more often cited the influence of other smokers and negative affect. In a prospective study, Swan and colleagues (in press) found that craving predicted relapse for women and not for men, while psychological withdrawal symptoms predicted relapse among men but not women. Studies that have analyzed reports of specific relapse episodes (Shiffman 1982, 1986a) have found no gender differences.

The large study by Swan and coworkers (in press) of treated smokers suggests that sex differences in factors associated with relapse may be pervasive. They found almost no overlap between men and women in the factors that predicted relapse. The following factors predicted relapse among women, but not men: the machine-rated nicotine delivery of cigarettes, employment status, rated likelihood of success, and lower work strain. Among men, relapse was predicted by greater stress (hassles) and higher work strain. Campbell (1983) also reports sex differences in predictors of outcome, some of which contradict Swan's findings, and Guilford (1967) reports sex differences on almost all aspects of cessation and maintenance. Although it may be premature to draw conclusions about the causes of relapse among males and females, clearly sex differences must be examined in future work.

Smoking and Quitting History

Smoking History

Most studies indicate that the length of a person's smoking history influences the process of initial cessation (Pomerleau, Adkins, Pertschuk 1978) but is unrelated to relapse (Ashenberg 1983; Carl 1980; Coppotelli and Orleans 1985; Cummings et al. 1985; Evans and Lane 1981; Garvey, Heinold, Rosner, in press; Hirvonen 1983; Horwitz, Hindi-Alexander, Wagner 1985; Jacobs et al. 1971; Pomerleau, Adkins, Pertschuk 1978; Swan et al., in press). The two studies that report relationships between length of smoking history and relapse are contradictory, with one reporting that smoking longer increased relapse risk (Graham and Gibson 1971) and the other reporting an inverse relationship between the duration of smoking and the risk of relapse (Eisinger 1971).

Conflicting findings have been reported for the number of cigarettes smoked per day. Although there are some positive findings (Ockene et al. 1982; Shapiro and Gunn 1985), most studies suggest that the number of cigarettes smoked is not a good predictor of relapse (Campbell 1983; Coppotelli and Orleans 1985; Cummings et al. 1985; Eisinger 1971; Evans and Lane 1981; Graham and Gibson 1971; Hirvonen 1983; Horwitz, Hindi-Alexander, Wagner 1985; Jacobs et al. 1971; Pomerleau, Adkins, Pertschuk 1978; Swan et al., in press). A few studies do find an effect of the number of cigarettes smoked on initial cessation (Hirvonen 1983). Precessation cigarette consumption has been positively associated with the length of time between having an initial lapse and a return to regular smoking (Brandon, Tiffany, Baker 1986). It should be noted, however, that number of cigarettes is only a rough indicator of actual intake, particularly for levels above 20 cigarettes/day.

Kabat and Wynder (1987) reported that the time between waking up and smoking the first cigarette was a good predictor of outcome. This variable represents one item on the Fagerström Tolerance Questionnaire (Fagerström 1978) and appears to be strongly related to physical dependence.

Smoking Typologies

Although their predictive value has been questioned (Joffe, Lowe, Fisher 1981), smoking typologies have been widely used in an attempt to classify smokers or smoking situations (e.g., smoking for stimulation, handling, relaxation; Ikard, Green, Horn 1969). The strongest evidence for the relationship of type of smoking to relapse has been found with people who smoke to control negative affect. In a widely cited study, Pomerleau, Adkins, and Pertschuk (1978) reported that people who said they smoked when experiencing negative affect were more likely to relapse. Similarly, Campbell

(1983) reported that smokers who experience craving when emotionally upset were more likely to relapse. These findings are diluted, however, by those of other studies showing no relationship between negative-affect smoking and relapse (Coppotelli and Orleans 1985; Eisinger 1971; Garvey, Heinold, Rosner, in press; Jacobs et al. 1971).

Quitting History

Several studies have found a positive relationship between number of previous quit attempts and success in quitting smoking (Brandon, Zelman, Baker, in press; Tiffany, Martin, Baker 1986). However, other studies report no relationship between the number of prior quit attempts and relapse (Swan et al., in press; Horwitz, Hindi-Alexander, Wagner 1985; Cummings et al. 1985; Coppotelli and Orleans 1985; Ockene, Benfari et al. 1982). Some studies in fact report that subjects with fewer previous quit attempts are more successful in maintenance (Horwitz, Hindi-Alexander, Wagner 1985; Graham and Gibson 1971; Garvey, Heinold, Rosner, in press). Garvey and Hitchcock (1987) found that among recidivists, smokers with more past experience in quitting showed a slower rate of progression to regular smoking. Gottlieb and coworkers (1981) and Hirvonen (1983) also report data that suggest a positive relationship between duration of the longest previous cessation effort and successful maintenance. Clearer descriptions of quitting history with respect to both number of previous quit attempts and duration of abstinent periods would be helpful in evaluating the relationship between quit attempts and outcome.

Withdrawal and Dependence

Withdrawal symptoms, whether elicited by acute deprivation or by conditioned stimuli, are hypothesized to be the link between dependence and relapse (Baker, Morse, Sherman 1987; Shiffman 1979; Wikler 1965). The tobacco withdrawal syndrome consists of a cluster of symptoms that are typically experienced after even brief or partial tobacco deprivation (Hughes and Hatsukami 1986; American Psychiatric Association 1980, 1987; Chapter IV). The symptoms include craving for cigarettes, irritability, anxiety, difficulty in concentrating, restlessness, and increased appetite (American Psychiatric Association 1987). Some physical signs are also commonly reported, but with the possible exception of bradycardia, these appear to be less consistent (Shiffman 1979; Hughes and Hatsukami 1986). Especially significant is the fact that the syndrome has a rapid onset and generally declines within 2 weeks (Shiffman 1979; Shiffman and Jarvik 1976; Cummings et al. 1985; Gottlieb 1985).

Several studies have examined the role of withdrawal symptoms as predisposing factors for relapse. In a retrospective study, Burns

(1969) reported that recidivists cited withdrawal symptoms as the most common reason for relapse. Other retrospective studies at least partially support this finding (Garvey, Heinold, Rosner, in press; though see Evans and Lane 1981). Gottlieb (1985) found that both physical and psychological withdrawal symptoms predicted early relapse in a group of treated smokers; symptoms accounted for 14 percent of the variance in smoking after 2 weeks. Other investigators have also found that mood disturbance, a possible withdrawal symptom, predicts relapse (Hall et al. 1984; Hirvonen 1983; Manley and Boland 1983). Manley and Boland (1983) found that mood disturbance characterized relapsers even before they quit and after they resumed smoking. The literature also includes negative findings (Garvey, Heinold, Rosner, in press; Hughes and Hatsukami 1986; Swan and Denk, in press; Swan et al., in press).

Although craving is difficult to define precisely (Kozlowski and Wilkinson 1987), a number of studies have reported relationships between craving and relapse (Campbell 1983; Garvey, Heinold, Rosner, in press; Gottlieb 1985; Hirvonen 1983). The effect appears to be more marked among female smokers, with several studies reporting that it is a significant predictor of relapse only among women (Guilford 1967; Gunn 1986; Swan et al., in press).

Cognitive Factors

Concern About Weight Gain

Quitting smoking often results in weight gain (Grunberg 1986; Chapter IV). Multiple factors may contribute to postcessation weight gain, including decreased metabolism, increased food consumption, and increased preference for sweet-tasting, high-caloric foods (Grunberg 1982). Highly dependent smokers and those who tend to eat in response to specific emotional and environmental cues appear to be at greatest risk of gaining weight following smoking cessation (Emont and Cummings 1987; Hall, Ginsberg, Jones 1986; Chapter VI).

The data relating concern about weight gain to relapse are inconsistent. Klesges and Klesges (in press) found that women were more likely to report relapse for weight-related reasons. Other studies have found that concern about weight gain was not a major determinant of relapse (Fuller 1982; Greaves, Barnes, Vulcano 1983; Hirvonen 1983; Shapiro and Gunn 1985). Though there are exceptions (DiClemente 1981), studies typically report that recidivists experience less weight gain than successful abstainers (Manley and Boland 1983; Hall, Ginsberg, Jones 1986). In at least some of these studies, this cannot be confounded by the effects of continued abstinence, because the studies used prospective designs in which weight gain was assessed prior to relapse (Hall, Ginsberg, Jones

1986). Even so, the possibility remains that relapsers are more weight conscious in the first place and exert greater efforts to curtail initial weight gain (Hall, Ginsberg, Jones 1986; Herman and Polivy 1975). Smoker perceptions concerning weight gain may be critical. For some individuals, a gain of only 2 or 3 pounds may be viewed as a cause for great concern. Other individuals may be essentially indifferent to weight gains of 15 to 20 pounds.

Self-Efficacy

Bandura (1977a, 1982) proposed a common mechanism underlying behavioral change achieved by different procedures: successful psychological interventions all function by creating and strengthening expectations of personal mastery or efficacy. An efficacy expectation is the conviction that one can execute the behaviors necessary to achieve a desired outcome. Such expectations are assumed to affect the initiation of coping behavior, the amount of effort that will be expended to maintain coping behavior, and the persistence of coping behavior in the face of external and internal obstacles.

Self-efficacy is an important construct in Marlatt's theory of relapse. Marlatt's theory specifies that people's ability to resist the use of a substance (e.g., cigarettes) in a high-risk situation depends on, among other factors, their self-efficacy level (Marlatt and Gordon 1980). If people have expectations that they can cope with a smoking urge without smoking, they are less likely to relapse. Moreover, people who successfully resist temptation should experience an increase in self-efficacy. The theory also states that self-efficacy is a determinant of whether people who experience an initial lapse are able to prevent escalation to full relapse.

Various scales assumed to measure self-efficacy have predicted smoking status at followup (Coelho 1984; DiClemente 1981; Killen et al. 1984; McIntyre, Lichtenstein, Mermelstein 1983; Ockene et al. 1982; Yates and Thain 1985) and latency from treatment end to relapse (Brandon, Tiffany, Baker 1986; Brandon, Zelman, Baker, in press; Erickson et al. 1983; Tiffany, Martin, Baker 1986). Efficacy ratings have also predicted smoking intake after a controlled-smoking intervention (Godding and Glasgow 1985) and have differentiated joiners from nonjoiners of a smoking treatment program (Brod and Hall 1984).

Important qualifications, however, relate to the timing of the relapse assessment and the subject sample observed. Studies predicting relapse that are based on all treatment subjects (including those who never achieve abstinence) will achieve higher correlations with outcome than will studies assessing only abstinent subjects. Self-efficacy is a less useful predictor when measured shortly after

cessation rather than after 1 or 2 months of abstinence (Baer, Holt, Lichtenstein 1986).

Condiotte and Lichtenstein (1981) reported seven distinguishable clusters of smoking situations and found a congruence between the situation clusters for which subjects indicated low self-efficacy and the clusters that comprised their actual relapse situations. However, a conceptual replication of the use of efficacy subscales has not demonstrated utility (Baer, Holt, Lichtenstein 1986). Thus, at this point situation-specific self-efficacy assessments have not proved to be of value.

Self-efficacy may reflect the influence of diverse treatments or smoking history variables related to cessation success. Skills training, for example, might be effective to the extent that it enhances smokers' beliefs that they can cope with temptation. Aversion therapy might be effective to the extent that smokers attribute their self-punishment to their high motivation to quit and their ability to use available resources to help stay abstinent. Self-efficacy may in fact be confounded with Bandura's (1977a) concept of outcome expectancy. Rather than measuring subjects' convictions that they could execute specific coping behaviors, most of the studies simply assessed subjects' confidence that they would resist the urge to smoke in the future.

The global construct of self-efficacy is somewhat ambiguous. Self-efficacy may include not only response effectiveness, but also motivation to quit and judgment of skills necessary to undertake the quitting program. Self-efficacy as a global predictor can be useful. However, it may be more important to assess what skills individuals learn from different treatment components. A better understanding of the process of acquiring competency in quitting is needed. Knowledge of the specific treatment components that enhance self-efficacy could be significant in developing and refining effective interventions.

Outcome Attributions

Attribution theory suggests that individuals who attribute their behavioral change to internal factors are more likely to successfully maintain their change (Davison and Valins 1969). This hypothesis was supported in a study by Harackiewicz et al. (1987) which found that, for individuals participating in intrinsically oriented treatment programs (a self-help manual emphasizing individual cessation efforts either with or without nicotine polacrilex gum), internal attributions for initial success were significantly related to longer maintenance of nonsmoking. Contrary to the hypothesis, however, these investigators found that external attributions were positively related to long-term maintenance for individuals participating in extrinsically oriented treatment (nicotine polacrilex gum with a self-