Introduction

In spite of a decrease in adult smoking since the dissemination of the 1964 U.S. Surgeon General's Report on Smoking and Health, there is discouraging evidence that smoking among teenage boys is remaining virtually constant and among teenage girls it is actually increasing. It is apparent that more knowledge is needed concerning the way in which the psychosocial factors that may contribute to the initiation of smoking can be applied to the development of effective strategies to deter the onset of smoking.

It is possible that prevention programs directed at children and adolescents have generally placed too much confidence in merely communicating knowledge about the dangers of smoking. Developers of these programs may assume that such fear arousal will in itself be sufficient to thwart smoking. In fact, as will be amplified later in this chapter, by the time children reach junior high school, almost all of them believe smoking is dangerous. It appears that communications concerning the dangers of smoking whether delivered from schools, churches, voluntary agencies, mass media, the family, peers, governmental agencies, industrial organizations, consumer organizations, or labor unions (individually or collectively) have, indeed, been effective in persuading children and adolescents that smoking is dangerous. However, it is also evident that fear of the consequences of smoking may in itself not be sufficient to discourage a substantial number of children from beginning to smoke when they approach adolescence.

Some investigators in this field have contended that at an earlier level of the child's development, perhaps between the ages of 4 to 9 or 10, the child takes quite literally the dangers of smoking. In fact, it is often observed at this level of development that children may be especially worried if they observe a parent or older sibling smoking. They will admonish them to stop smoking because it "can cause cancer or a heart attack." Yet as they approach adolescence, many of these same children will begin smoking.

Responses from the teenagers themselves suggest that peer pressure to smoke may be one of the major influences. There is also some evidence that the smoking parent becomes a model for the child. If both parents smoke there is a greater likelihood that the child will begin smoking than if only one parent smokes or if neither parent smokes. But even if one parent smokes, this may influence the child to smoke more than if neither parent smokes. Interestingly, if an older sibling and both parents smoke the child is about four times more likely to smoke than if there were no smokers in the family.

The influence of the mass media in the initiation of smoking is somewhat more difficult to establish. Smokers are depicted in films and television, as well as in cigarette advertising which tends to portray them in interesting and exciting environments, suggesting that attractive, desirable people tend to smoke. This would logically be

expected to influence children and teenagers much as the media and advertising affect the behavior of adults. Yet, the relationship between exposure to the mass media and the initiation of smoking is difficult to isolate from the other concurrent influences to which the child is exposed. In fact, a variety of psychosocial influences may interact to influence some children to begin smoking.

Some investigators examining the issue of why fear arousal may often have such a limited effect on health behavior suggest that much of the information communicated to children concerning smoking and its dangers may be too general and not sufficiently personalized. Also, the suggested harmful effects of smoking in many smoking control messages violate the concept of "time perspective." As children grow older they recognize that people around them who smoke do not die instantly and that heart attacks or cancer are not a certainty. They may need to be exposed to evidence that smoking has immediate physiological effects on the body. Younger adolescents particularly live in the present and are not preoccupied with the future. Emphasizing what might happen to them when they are much older may not be an effective way to persuade many of them to resist the pressures to begin smoking.

Becoming a smoker may have the immediate value to some teenagers of being accepted by their peers, feeling more mature because smoking is an adult behavior forbidden to the child, providing a level of physiological stimulation and pleasure, and might even serve the function of an act of defiance to authority figures. The prevention programs reviewed rarely incorporate such concepts. Rather, they focus primarily on information relating to the long-term dangers of smoking.

Furthermore, too few of the prevention programs are evaluated with sufficient rigor. As a result, in the same sense that there is insufficient basic behavioral research to link clearly many psychosocial factors to the initiation of smoking in children and adolescents, it is difficult to determine if many prevention programs significantly deter the onset of addictive smoking. Even if a program results in increased knowledge concerning the long-term dangers of smoking, in the absence of valid evidence of a direct impact on the incidence of smoking itself, it is possible that many widely disseminated prevention programs are, in the long-run, of only questionable value in actually deterring smoking. All of this suggests many avenues for future research and prevention programs.

To elaborate on the various points discussed above, the sections which follow deal with current smoking patterns and beliefs, relevant conceptual models in developmental and social psychology, typical psychosocial influences in the smoking decision, critical evaluations of some current prevention programs, and finally, some recommendations for future research and prevention programs.

Current Smoking Patterns and Beliefs

While cigarette smoking in the United States for adults over age 21 has declined, there has been a growth in the amount of smoking among the pre-adult population, primarily due to a dramatic increase in smoking among teenage girls (*61*). But care needs to be exercised when interpreting the findings of the studies reported since definitions of such terms as "regular smoker," "occasional smoker," "experimental smoker," and "nonsmoker," vary from one study to the next. For example, four national surveys conducted at 2-year intervals from 1968 through 1974 by the National Clearinghouse for Smoking and Health (*61, 86*) define a current regular smoker as one who smokes one or more cigarettes per week. On the other hand, an antismoking education study conducted at the University of Illinois (*18*) defines a current regular smoker as one who smokes cigarettes just about every day. Also contributing to the ambiguity of results is the way in which the categorization of frequency of smoking is dealt with in the analysis of results. For example, in the four national surveys previously cited, experimental smokers (those who have smoked at least a few puffs but less than one hundred cigarettes) were combined with nonsmokers in the analysis of the data. Experimental smokers are extremely important and should not be neglected in data analysis since experimental smoking is obviously the initial step toward confirmed smoking (*42*).

In the four surveys (*61*) conducted by the National Clearinghouse, approximately 16 percent of the teenage population, aged 12 to 18, were current regular smokers in 1974. The rate of regular smoking for the same age group in 1968 was approximately 12 percent. In the first survey, only about half as many girls as boys regularly smoked, but by 1974 this difference had virtually disappeared. In fact, regular smoking had slightly decreased for boys from 1970 to 1974, but this decrease was easily offset by the dramatic rise in smoking by girls.

Relevant to the problem of teenage smoking is the age of initiation of smoking. A significantly larger percentage of regular smokers aged 12 to 14 were reported among teenagers in 1974 (approximately 12 percent) than in 1968 (approximately 6 percent). This increase in regular smoking at younger ages suggests that the average age of the initiation of smoking is decreasing.

Further evidence concerning the age of initiation of smoking is available from retrospective data reflecting self-estimates of onset of smoking in the Current Population Surveys of 1955 and 1966 (*1*). No analysis of age trends in smoking initiation among males was reported since the number of male respondents was low, particularly in the 1966 survey. However, the responses from the female respondents, regardless of their current age, suggest a shift in the initiation of smoking to a younger age. For example, over twice as many females, aged 18 to

24, classified themselves as regular smokers by age 15 in 1966 than did the respondents of the same age group in 1955.

In the national surveys between 1968 and 1974 (*61*) the relationship between various factors related to socioeconomic status and smoking were examined. For example, teenagers who are employed outside the home are twice as likely to smoke as teenagers who are not employed. Also, educational and vocational aspirations are related to smoking. Students who plan to go to college are the least likely to smoke. A study conducted by Borland and Rudolph (*9*) determined that socioeconomic status bears some relationship to smoking in high school students (children in lower socioeconomic levels are more likely to smoke), but socioeconomic status correlates less with smoking than parental smoking or poor scholastic performance (although all three variables are themselves correlated).

The literature fails to address adequately the initiation of pre-adult smoking. Rather, the emphasis is on "regular" smokers. Nevertheless, inferences from such data may be helpful in suggesting factors that are related to the initiation of smoking.

As would be expected, beliefs of teenagers about smoking are related to whether or not they smoke. Of course, smokers generally hold more favorable attitudes toward smoking than do nonsmokers (*65*, *75*). Nevertheless, data (*59*) suggest that even teenage smokers seldom consider the decision to smoke a wise decision. For example, 77 percent of smokers believe that it is better not to start smoking than to have to quit. Over half of the teenage smokers believe that cigarette smoking becomes harmful after just 1 year of smoking. Eighty-four percent say it is habit forming, while 68 percent agree that it is a bad habit. Of all teenagers, 78 percent believe that cigarette smoking can cause lung cancer and heart disease. Eighty-seven percent of all teenagers and 77 percent of teenage smokers believe that smoking can harm their health. The vast majority of teenagers consider smoking as habit forming, but almost two-thirds do not feel that becoming addicted to smoking is an imminent threat to their health. Experimental smoking is considered safe.

Fishbein (*34*) cites evidence from a study conducted for the American Cancer Society in 1975 which suggests that teenage smoking is perceived by teenagers as more prevalent than it actually is. Eighty-three percent of the teenagers in this survey tend to think of other teenagers as being smokers rather than nonsmokers.

Finally, it should be pointed out that knowledge or beliefs about the dangers of smoking are often confused with attitudes toward smoking (*10*). Attitudes may be much more complex than simple beliefs about the harmful effects of smoking. Various factors influencing the complexity of attitudes toward smoking are discussed in the most recent report of the four national surveys mentioned earlier (*61*). These factors include the adverse effects of smoking on the individual's

health and on the environment (pollution), the psychological and sociological benefits of smoking (e.g., "makes you feel good"), rationalizations that allow smoking, perceptions of reasons for smoking and for smoking initiation, the negative stereotypes concerning smokers, attitudes toward authority, and control over one's destiny.

In essence, when considering both current smoking patterns and beliefs among children and adolescents, the factors related to smoking can be categorized in terms of perceived psychosocial benefits versus actual threats to health. Considering this dichotomy, the suggestion of the U.S. Public Health Service (*61*) should not be ignored:

> It is futile to continue to tell teenagers that smoking is harmful and that they shouldn't do it. They know that it is harmful. Most do not *want* to do it. The most effective thing that we can do is to help them to understand the benefits of smoking as compared with the costs and dangers so that they will have the facts that they need in order to make a thoughtful decision as to whether to smoke or not to smoke (p. 27).

Relevant Conceptual Models in Developmental and Social Psychology

Understanding the factors involved in the initiation of smoking among children and adolescents is a complex endeavor demanding the utilization of diverse conceptualizations. This section will consider four representative conceptual models in developmental and social psychology that would appear to be potentially useful in generating hypotheses to account for the initiation of smoking among the young and in providing conceptual bases for prevention programs. These conceptualizations are Piaget's Cognitive Development Theory, Erikson's Theory of Psychosocial Development, Bandura's Social Learning Theory and McGuire's Persuasive Communication Model.

The Cognitive Developmental Theory of Piaget (*26*, *69*), one of the most influential cognitive theories, is concerned with the nature and origin of knowledge. Piaget's view of the development of knowledge would appear to offer some applications to understanding the informational and decisional aspects of the initiation of smoking in the developing child.

Piaget views knowledge as developing out of the individual's adaptive interaction with the environment through the processes of assimilation (incorporation of concepts into existing cognitive structures) and accommodation (modification of cognitive structures). There are four major stages of intellectual development: (1) sensory-motor period (birth to 2 years), involving simple perceptual and motor adjustments to immediate environmental phenomena; (2) preoperational period (2 to 7 years), involving a preconceptual phase (the

emergence of linguistic skills and symbol construction abilities) and an intuitive phase (the emergence of more complex thoughts, images, and classification abilities based on perceptual similarity instead of logical considerations); (3) concrete operational period (7 to 11 years), involving reversible intellectual operational ability (utilizing a mental representation of a series of actions), conservational ability (realizing that quantity remains invariant despite perceptual transformations), a clearly defined concept of class inclusion, and the ability to take the viewpoint of another; and (4) formal operational period (11 to 15 years) involving the realization that reality is but one of a set of all possibilities. Thinking in this last stage is characterized by hypothetical-deductive reasoning, combinational analysis (consideration of multiple factors), propositional and rule-governed logic, and a futuristic perspective.

Piaget's ideas, especially those dealing with developing knowledge about the physical environment, have been extensively explored, although the investigation and application of his concepts involving adaptation to the social environment have only rarely been studied. The initiation of smoking, apparently an age-related behavior, appears most often to occur within the context of social interactions. Additionally, smoking involves an important decisional component requiring the utilization of cognitive or knowledge structures.

By the time they reach the seventh grade, the vast majority of children believe smoking is dangerous to one's health (*31*). Yet despite this knowledge, many adolescents, aged 12 to 14, experiment with smoking, and roughly 4 to 5 percent will smoke regularly (weekly) (*61*). This situation suggests that "social adaptation" may override "intellectual adaptation" or knowledge. Knowledge of the dangers of smoking often motivates a preadolescent to become a crusader against smoking, while the social pressures occurring during early adolescence may outweigh the effects of this concrete knowledge. So, the individual who had been at an earlier age an antismoking crusader may become a regular smoker or at least an experimental smoker as a teenager. This conflict between knowledge of the dangers of smoking and smoking suggests the possibility of observing the development of smoking within the Piagetian framework.

One contemporary psychoanalytic developmental model of consequence is Erikson's Theory of Psychosocial Development (*24, 25*) involving eight psychosocial crises. These crises are: (1) trust vs. mistrust (0 to 1 year), (2) autonomy vs. shame and doubt (2 to 3 years), (3) initiative vs. guilt (4 to 5 years), (4) industry vs. inferiority (6 to 11 years), (5) identity vs. role diffusion (12 to 18 years), (6) intimacy vs. isolation (young childhood), (7) generativity vs. stagnation (middle adulthood), and (8) ego integrity vs. despair (later adulthood). Of particular interest with reference to the initiation of smoking are Erikson's fourth and fifth psychosocial crises.

Both the struggle to overcome inferiority and the effort to establish a self identity have been cited in one form or another by numerous researchers interested in interpreting the initiation of smoking in adolescents. For example, Erikson's "identity-crisis" in adolescence (being torn between the roles of child and adult) might be an interesting basis for explaining the apparent influence of peer pressure in the initiation of smoking, particularly if this notion were explored in some depth empirically.

A third contribution which has greatly influenced developmental and social psychology is Bandura's Social Learning Theory (*6*). Bandura's theory, which is concerned with imitative or modeling processes, would also seem to be useful in understanding the processes involved in the initiation of smoking. Social learning theory emphasizes the roles played by vicarious, symbolic, and self-regulatory processes in the acquisition of behavior. Further, this theory suggests the importance of reciprocal determination or the continuous mutual interaction between self-generated and environmental determinants in exploring human behavior. Bandura sees social learning as governed by four component processes: attention, retention, motor reproduction, and motivation or incentive.

Smoking appears to be initiated as a result of social influences or, more particularly, the imitation of models such as peers, media stereotypes, and significant adults (e.g., parents and teachers) (*27*). Considering the nature of smoking, a behavior with possible delayed aversive consequences and often more immediate social reinforcing consequences (especially for children and adolescents), it would seem that investigating smoking within the social learning paradigm would generate many useful hypotheses concerning the initiation of smoking. For example, the impact on children of the models of smoking parents or the impact of smoking adult models depicted in the mass media could be further explored in the context of social learning.

Communications models which examine information processing hold some promise for understanding the factors underlying the initiation of smoking as well as for developing more effective prevention programs. McGuire's (*53*) Communication Persuasion Model, for example, analyzes the persuasive impact of communications according to five component processes: attention, comprehension, yielding, retention, and action.

If the communicator wants the message to be accepted and acted upon, it is important to remember that individuals exposed to the message must be paying attention if communication is even to begin. Comprehension of the contents of the message is equally important. Yielding to or agreeing with the conclusions advocated in the message is vital if the communication is to have effects in the desired direction. Retention, or the maintenance of the induced agreement, is particularly important if the beliefs are to be operative when the individual is

challenged by exposure to messages countering the accepted belief. By measuring the individual's response to such challenges, a useful evaluation of the impact of the communication on the subject, the degree of yield to the message, and the amount of resulting behavioral change or action resulting from the message may be obtained. McGuire's model would appear to be useful in both preparing and evaluating communications related to smoking prevention programs for children.

One of the most interesting aspects of McGuire's model is his "inoculation" approach to attitude change. McGuire suggests that existing attitudes may be strengthened by inoculating individuals against counter arguments to which they may be exposed. The application of this model to the pressures to initiate smoking would consist of "inoculating" adolescents against the social pressures to smoke which they may encounter at some future time. For example, Evans, et al. (*31*), using this approach in filmed messages, acquaint adolescents with the nature of the various social pressures to smoke. In a second film, they are inoculated against these pressures by being presented coping "strategies" based on information obtained from adolescents themselves. Further variations of such an inoculation approach would appear to be a promising means of relating a concept in social psychology to the deterrence of smoking in children and adolescents.

Typical Psychosocial Influences on the Smoking Decision

As mentioned earlier, despite extensive educational efforts, the onset of smoking in school-aged children continues relatively unabated, with age and grade level at which smoking begins reflecting a downward trend from high school and junior high school into the elementary grades (*61*). This trend has been reported consistently in the literature (*18*, *29*, *84*) and has grown at such an alarming rate that Kelson, et al. (*46*) refer to it as "the growing epidemic." It is generally agreed that the most effective way to attack the problem would be to influence children not to initiate smoking (*29*, *88*). Developing strategies of deterrence is dependent upon identifying those influences that lead children to begin smoking. While not all influences have been identified, many of them can be discerned in the literature related to children and smoking. Predictably, the influences most frequently cited include the role of the family, pressures from peer groups, formal education programs, and the effects of messages transmitted through the mass media. To a lesser extent, studies that explore the influences of individual differences and environmental factors have been reported.

Changing Sex Roles

As mentioned earlier, the disappearance of differences between the incidence of smoking of boys and girls is quite apparent (*61*). The reasons for these differences are not clearly established. Possible explanations, such as a differential impact of antismoking messages on the two sexes, have not yet been empirically demonstrated. Another possibility is that many social differences between the sexes are gradually disappearing in the light of the women's movement. A third possibility derives from the finding that smoking by teenage girls may have been perceived as more socially acceptable in 1974 than in 1968. This may have resulted in more honest self-reports of smoking; so instead of teenage girls actually smoking more, a more accurate indication of smoking by girls was being recorded.

Parental Smoking Habits

Parents who smoke clearly influence the smoking behavior of their children. In families where both parents smoke, 22.2 percent of the boys and 20.7 percent of the girls are also smokers, compared to 11.3 percent and 7.6 percent where neither parent smokes (*61*). These proportions have remained consistent over time. Merki (*55*) lists parental smoking habits as a major factor directly related to smoking by junior and senior high school students. Wohlford (*89*) uses identification theory to predict a direct relationship between parent and child smoking behavior. This relationship appears to be stronger for boys than for girls, a finding Wohlford attributes to stronger peer influences relative to smoking for girls. A recent American Cancer Society study (*58*) seems to confirm this notion. Borland and Rudolph (*9*) indicate that parental smoking is the second best predictor of smoking behavior in high school students. Palmer (*68*) reports similar findings for junior high school students. Edson (*23*) discusses both parental modeling and children's efforts to combat parental smoking as a result of the School Health Curriculum Project. Evans, et al. (*31*), in a smoking-deterrence investigation, incorporate a positive message for coping with parental smoking models, emphasizing that children can resist the pressure to imitate parents who smoke. Programs designed to educate parents who smoke on how they may be influencing their children to smoke should be considered important components of prevention programs. Also, research should be encouraged to examine the precise effects on the child of the smoking parent.

Parental Acceptance of Children's Smoking

While parental approval of smoking has been suggested as a contributing factor in influencing children to smoke, Allegrante, et al. (*3*) do not find parental approval to be a signficant factor, confirming Williams' (*88*) earlier conclusion that both smoking and nonsmoking

junior high students report that their parents disapprove or would disapprove of their smoking.

Siblings Who Smoke

Although Piper, et al. (*70*) report no significant relationship between older siblings and the smoking behavior of the subjects in their longitudinal study, two major surveys (*61, 88*) implicate the smoking behavior of older siblings as a possible influence on younger children. Twenty-eight to thirty percent of the boys and 25 to 26 percent of the girls who report regular smoking also have older siblings who smoke. If an older sibling and both parents smoke, the child is four times as likely to smoke as a child who has no smoking model in the family (*61*). Williams also reports the lowest incidence (4.2 percent) of smoking in those children who live in a household where neither parent smokes and where there are older siblings, none of whom smoke.

Rebellion Against Family Authority

While cigarette smoking as a form of rebellion against family and adult authority has not received much attention in the literature, a recent survey (*42*) indicates that smoking among teenage girls may reflect rebellious, anti-authority behavior.

Peer Pressures

Peer pressure is widely assumed to be a significant causal factor in the initiation of smoking. The strong influence of peer group pressures is generally evident in young adolescents (*38, 78*), but the precise relationship of such pressure to the initiation of smoking is more difficult to establish.

In an intensive participant-observation study of ninth-grade students with a follow-up 2 years later, Newman (*64*) reports that peer pressure and conformity to group status norms were perceived by subjects to be major factors in smoking. The relationship was not as strong when the subjects were in the 11th grade, but was significantly different at both grade levels (*63*). A survey by Palmer (*68*) of more than 3,000 junior high school students finds that the prevailing peer model to be the single most important variable contributing to the onset of smoking in this age group.

In a longitudinal study of Canadian school children, Matthews (*51*) finds that peer influence was a major factor in the initiation of smoking in the population surveyed. The influence of peers seems to come from "best friend" relationships, rather than from large or diversified group pressure. In a multivariate study of correlative factors in youthful cigarette smoking, Levitt and Edwards (*50*) report that having a best friend or group of friends who smoke appears to be the best predictor of smoking in children from the 5th through the 12th

grade. Bynner (*13*) finds the most important variable in explaining smoking behavior in English and Welsh schoolboys is the number of their friends who smoke. Williams (*88*) reviews a substantial number of studies which also conclude that pressures from peers and best friends are important influences to smoke.

In prevention programs, Newman (*63*) cautions against the utilization of nonsmoking student models whose general characteristics differ from those of the target population. The use of such models may alienate the target population against the antismoking message. Evans (*27, 31*) approaches the peer-pressure problem by presenting strategies for resisting peer pressure as filmed-sequence roles played by students selected from the target population.

School Environment

Specific school health education programs are addressed comprehensively in other chapters in this report. The dominant role of the school in the life of children and adolescents suggests the importance of the school environment in providing influences guiding the smoking decisions of children. Two important recommendations specified by the American Association for Health, Physical Education, and Recreation (*4*) are for schools to accept the responsibility for providing smoking education programs and for teachers and other school personnel to implement these programs.

The role of teachers, health professionals, and other adult role models as exemplars for the young is examined by a number of researchers (*16, 62, 80*). It may be important that such adult role models make positive statements related to their position on smoking. For example, teenagers perceive teachers as likely to be smokers (*42*). Sixty-eight percent of the girls and 67 percent of the boys judge most teachers to be smokers. A recent American Cancer Society survey (*5*) states that only 23 percent of female teachers and 18 percent of male teachers actually smoke. Such a difference in actual and perceived smoking behavior indicates a lack of communication in an area that could be critical in influencing the smoking decision in children and young adolescents.

Mass Media

In a Task Force Report on Respiratory Diseases, the National Institutes of Health (*60*) states that mass media have been used extensively in antismoking efforts, but exactly how they influence behavior is unclear. Ward (*87*) reports that, in a study designed to ascertain attitudes toward television commercials and to analyze the effects of television advertising on adolescents, the television medium appears to influence the formation of ideas and attitudes, yet does not "trigger" adolescents to buy a product. Ward's study indicates that cigarette ads are perceived by teenagers as hypocritical and are listed

as "least-liked" while antismoking ads are perceived as "straightforward" and are liked. The effects of messages in other media, such as billboards, magazines, and displays need to be more precisely studied. Mendelsohn (*54*) concludes that, in general, current mass media efforts to educate the public concerning health issues are disappointing. It is possible that because of cognitive and social differences in various development stages of children and adolescents, mass communications may not be the most appropriate means to reach children and adolescents with smoking-deterrence messages. More specifically, targeted communications might be better presented in selected target situations.

Individual Characteristics

The notion of being able to identify potential smokers has been an elusive goal for researchers. There are very few investigations relating personality variables to teenage smoking. Smith's (*79*) review of 35 personality and smoking studies found only four related to teenage smoking. After a search of the literature related to personality variables that may influence the initiation of smoking, Williams (*88*) concludes that "both the empirical results of previous studies and discussions of the state of the art of research into personality correlates suggest that personality will not provide the most fruitful approach to understanding why children do or do not take up cigarette smoking" (p. 15). There appears to be some agreement that personality is more related to the amount smoked than to who will begin to smoke (*17, 52, 85*).

Individual differences in smoking are related to variables such as age-in-grade, achievement in areas important to the young person, social involvement, and participation in organized activities. Creswell, et al. (*18*), and Laoye, et al. (*48*) find that student educational expectations are related to their smoking behavior. Creswell, et al. (*18*) also find some support for a relationship between above average modal age and smoking behavior. They find smoking to be perceived as a compensatory behavior for students who had not achieved success in more traditional roles. Hasenfus (*37*) postulates that children and young people may begin smoking out of a normal curiosity, but soon come to view smoking as a coping behavior similar to adult usage. Bergin and Wake (*7*) state that teenage smoking appears to be triggered by changes in living habits such as changes in residence, absence of a parent, or matriculation in a university. No conceptual framework or organized line of research has systematically guided the research related to individual characteristics in the initiation of smoking, and the literature reflects the patchwork quality of the existing knowledge.

Perceptions of Dangers of Smoking

A recent trend in smoking and health research involves an attempt to identify and modify perceptions on the part of children and adolescents of the dangers of smoking. Evans, et al. (*29*) suggest that fear-based smoking-deterrence messages to this age group, enumerating the future costs of smoking—heart disease, lung cancer, and other serious diseases or death—are often ineffective because most children and young adolescents are more present- than future-oriented. They find it difficult to perceive such future dangers as meaningful or even important. Studies designed to communicate the immediate physiological effects of cigarette smoking on healthy young people (*35, 77*) may help to make the health dangers more immediate and compelling. Filmed demonstrations comparing teenage smokers and nonsmokers by the nicotine in their saliva, the carbon monoxide in their breath, and their heart function are components of the 3-year longitudinal study by Evans, et al. (*31*).

Critical Evaluations of Some Current Prevention Programs

Several reviewers (*29, 34, 67*) point out the serious limitations that exist in evaluating research in this area. A lack of common definitions of smoking behavior, reliance on self-reporting and lack of objective measures of smoking, attrition rates in long-term studies, inappropriate statistical analyses, biased sampling errors inherent in using available volunteer populations, and lack of appropriate control groups are major limitations of the vast majority of the studies reviewed. The results of such studies must thus be viewed with caution.

Most smoking prevention programs have not been specifically directed at children and adolescents who logically should be the key target of such programs. Rather, they have been general public information campaigns conducted by private and governmental agencies, such as the American Heart Association, the American Cancer Society, and the U.S. Public Health Service. Various in-school educational programs incorporating information concerning the health hazards of smoking into course curricula and special programs with certain unique features have also been instituted.

Public Information Campaigns

Major criticisms are leveled at many public information smoking-prevention campaigns. Too often these programs fail to build in adequate evaluations. Also, they tend to be notional and atheoretical. Content and persuasive strategies in these campaigns are too often arbitrarily chosen, based on subjective judgment, rather than being systematically pretested. Bradshaw (*11*) reviews 14 public educational campaigns between 1960 and 1970 involving local communities, schools, and universities in both the United States and the United Kingdom. He

concludes that the effects of these campaigns on smoking behavior have been minimal at best with many producing no apparent effect. The failure to conduct adequate follow-up evaluations and to include comparison control groups in studies carried out are among other criticisms made of these campaigns. Recognizing the many limitations of these campaigns, Bradshaw calls for more systematically developed communications which can become the basis of widely disseminated programs to deter young people from acquiring the smoking habit.

Public information campaigns aimed at prevention can also be criticized for failing to evaluate the program's impact over extended periods of time. For example, Fishbein (*34*), in a recent report to the Federal Trade Commission, indicates that at the present time we do not have enough information about the beliefs, attitudes, and intentions already held by the public with respect to smoking decisions (i.e., to initiate, reduce, increase, or stop) or information regarding the degree to which these decisions are under attitudinal or normative control. Fishbein suggests that this information is necessary in order to develop communication materials of all kinds that would contain the most appropriate arguments for affecting a given smoking decision. Concluding his report, he states that "Although there is much that could be done immediately to inform the public, much more research is necessary if one wishes to maximize the likelihood that information will also influence a smoking decision" (p. vi).

Most critically, public information campaigns directed at prevention of smoking have been too broadly targeted. They have not reflected the beliefs, attitudes, and intentions held by what should be the prime target for prevention programs: children and adolescents. As mentioned earlier, such campaigns must take into consideration the specific developmental level of the child or adolescent. Evans, et al. (*31*), for example, find that older adolescents may respond to different smoking prevention messages than younger adolescents.

School Programs

The majority of school programs are preventive in intent, whether they are oriented toward exploring generic research issues or are merely single classroom demonstrations of so called "hands-on" programs designed to illustrate some specific aspect of smoking.

Unfortunately, the vast majority of such programs possess methodological shortcomings, particularly in evaluation designs. Many of the reports of these programs fail to present the documentation necessary for the most rudimentary evaluation by the reader. It should be noted, however, that much of the literature related to children and smoking is found in publications that may not require or encourage reports which are carefully detailed and which include rigorous evaluations.

Many of these reports are anecdotal or descriptive in nature or are offered merely as guidelines for curriculum planning and implementa-

tion. Such a morass of programs reported so loosely cannot be compared within any theoretical framework. This leads to frequent repetition of efforts. It appears that in school smoking-prevention programs, the "wheel" is regularly reinvented. Since a critical evaluation of most school programs is thus virtually impossible, at least some observations concerning current school programs will be presented and the implications of these observations for planning more rigorously evaluated programs will be discussed.

In a recent review, Thompson (*84*) expresses a general cynicism concerning the effectiveness of school programs. She further states that multimethod campaigns and youth-to-youth programs are generally ineffective. Terry and Woodward (*82*) report that relatively few teachers are trained as health educators, and Chen and Rakip (*15*) find serious problems in teacher implementation of programs on smoking and health. Teachers themselves often express a lack of confidence in their ability effectively to implement smoking education programs. This inability may be reflected in Levitt's (*49*) survey of 50,000 Indiana school children, in which less than 1 percent of the students indicate receiving information about smoking in school health classes. A comprehensive program for teacher training, at the preservice and inservice levels, in evaluating and implementing smoking and health programs is an area where effective action could be taken based on present knowledge and research.

One promising trend involves preplanned longitudinal, comprehensive studies in school settings carried out by large institutions (e.g., universities) with a strong commitment to evaluation. The pressure to produce immediate and specific effects on smoking is somewhat lessened because they are being carried out in the context of long-range evaluation. Thus the investigator has the opportunity to design conceptually sound projects based on sophisticated models. Such studies are also fruitful in producing spinoff studies that test specific hypotheses, pinpoint effects, and eliminate unworkable approaches. Stringent preplanned evaluation is an integral part of the best of these in-school programs. While such long range programs, implemented and evaluated over substantial periods of time, are both costly and difficult to manage scientifically and logistically, the data produced may have important implications for developing systematic theoretical concepts and in generating new research. Such studies may come closer to isolating the complex social, physiological, and psychological factors that underlie the smoking phenomenon. Generally, such programs are carried out so that the community continues to benefit from the program after its completion, since it provides pretested and evaluated materials for incorporation into school curricula.

One of the best known of the longitudinal, comprehensive studies is the National Clearinghouse for Smoking and Health's School Health Curriculum Project (based on the so-called Berkeley model) that has

been introduced into more than 200 school districts in 28 States. The curriculum is based on results of empirically tested concepts related to communicating health knowledge to children, including information about smoking. It is being implemented in programs from kindergarten through seventh grade at the present time. Evaluation components of the program are just now beginning to yield results. In the smoking area, a substantial relationship between enrollment and nonenrollment in the program and smoking knowledge and behavior has been claimed (*58*). However, a careful inspection of the quasi-experimental study on which that assertion is based reveals only small inconsistent differences (*56*). Detailed descriptions of the implementation of this program are given by Edson (*23*), Caramanica, et al. (*14*), and Albino and Davis (*2*). (The School Health Curriculum Project is discussed more fully in another chapter in this report.)

The University of Illinois Antismoking Education Study (*19, 20*) has been underway for more than a decade. It has produced several smoking-measurement instruments that have been used in a number of smoking studies. These instruments incorporate informational, attitudinal, and self-report behavioral components but have not been validated against more objective measures of actual smoking.

The Illinois Antismoking Education Study generated several kinds of studies which address themselves to evaluating various in-school approaches to control smoking. For example, in one study, Irwin, et al. (*41*) examine the relative impact of the regular classroom teacher as a smoking information communicator compared with teachers especially trained in health communication. Although they find that the classroom teacher was at least as effective as the specially trained teacher, more recent studies (*82*) do not necessarily support this conclusion. An intention-to-smoke measure was also developed as a result of the Illinois study. Using this measure, Laoye, et al. (*48*) find that a 2-year projection of smoking could be successfully demonstrated. Merki, et al. (*55*) explore smoking behavior of rural high school students and find that student smoking is related to parental smoking habits, participation in school group activities, and lower educational aspirations. From a 9-month participant-observation study, Newman (*63, 64*) concludes that both covert and overt smoking are low-status activities for ninth grade girls and overt smoking is a low-status activity for boys. (The Illinois study is also described more fully elsewhere in another chapter in this report.)

In Houston a 3-year longitudinal study reported by Evans, et al. (*31*) is being undertaken. It is designed to train junior high school students to resist the pressures to smoke from peers, the media, and models of smoking parents. Also involved in this study are interventions that monitor smoking and those that communicate immediate physiological effects of smoking. A nicotine-in-saliva measure is employed to increase the validity of self-reports of smoking. A major purpose of the

study is to explore the feasibility of incorporating into school health programs inoculations-against-social-pressures-to-smoke messages in lieu of the frequently used fear-arousal, impersonal, information-centered communications. Preliminary results indicate that such intervention strategies, based on the use of films whose content is derived from feedback from students themselves, may be effective with some students in deterring the onset of addicted smoking, although the final results await the completion of the final years of the investigation. Also, further replications of this general approach to thwarting smoking behavior in adolescents, using either films or more personalized interventions, are being undertaken at Stanford (Cheryl Perry), the University of Minnesota (C. A. Johnson), Tyler, Texas (Richard Evans), and elsewhere.

General Comments

Obviously, the psychosocial factors that influence the initiation of smoking are varied and complex. Aside from a few promising prevention programs, most of them fail to encompass psychosocial conceptual frameworks. Obviously, there is also a great need for such programs to be more carefully planned, controlled, and evaluated.

Fodor, et al. (*36*) propose that educational programs that deal with the totality of man as a complex being offer the most promise. "Smoking education must, in fact, become health education, taking into consideration the multiplicity of factors related to smoking and health—physical, mental, and social" (p. 94). Rabinowitz and Zimmerli (*72*) recognize the complex, long-range problem:

> What seems most crucial for future health education planning.....is that a 'one-size-fits-all' approach is contraindicated to student health teaching in terms of message content, structure, and perhaps, classroom delivery. To achieve comparable outcomes it may be essential that several distinct approaches to smoking education be explored for social subgroups with demonstrably different backgrounds of exposure, involvement, and maturation (p. 330).

The best efforts at present appear to possess at least some conceptual basis, are long-term, multiphasic studies attempting to establish good baseline data, develop and test specific hypotheses using carefully controlled methods of investigation, employ objective measures of smoking to validate self-reports, and include evaluations of the program through several years of implementation.

The ideal prevention program would follow the example of Sweden (*76*) where a 25-year effort has begun whose objective is to make those born in 1975 a nonsmoking generation. The program began in 1974 with expectant parents and is presently concentrating on withdrawal clinics and other measures to develop a nonsmoking environment for those children born in 1975. Educational efforts for adults and children

and increased governmental control over advertising and marketing of tobacco products are being implemented, and an all-out effort is being made to create a nonsmoking generation in a nonsmoking environment, supported by both governmental efforts and the general public.

Some Recommendations for Future Research and Prevention Programs

Although recommendations for future research and prevention programs logically emerged in several earlier sections of this chapter, some additional recommendations may be in order. Most of the current research concerning psychosocial determinants of smoking in children and adolescents tends to be correlational in nature. Because of the limited amount of variance accounted for, it is difficult to establish a precise linkage between any given psychosocial influence and the initiation of smoking. Just as Jessor and Jessor (*43*) have found with respect to the use of other drugs, it is likely that an array of social influences precipitates the onset of smoking. What may be needed now is the selection of some of these specific influences for particular attention. For example, the influence of the mass media on smoking initiation, which currently appears to be uncertain, might be better understood through a series of small, well-controlled basic investigations. The results of such investigations should be interpreted within the context of the broader impact of the mass media on the behavior of children and adolescents to avoid the criticisms leveled at how the research concerning violence and television was conducted. Additionally, just as the focus in the area of television or films and behavior has shifted from exploring how they precipitate antisocial behavior to how they may encourage prosocial behavior (*6*), some of these investigations should also examine how the mass media have perhaps inadvertently contributed to the child's decision *not* to begin smoking, or to quit before he or she has become a confirmed smoker. Perhaps the use of mass media to counter prosmoking influences should also be further explored. A similar approach might be used to explore more explicitly how to counteract the impact of social pressures in the initiation of smoking (*27, 31*).

Lacking in most of the investigations reviewed is an adequate conceptual base. As discussed earlier, certain types of major conceptual models in developmental and social psychology have gone virtually unexplored as a source of hypotheses for research in the area of smoking in children and adolescents. Many other current conceptual directions in psychology could well be explored as they relate to smoking. The theory of cognitive dissonance (*33*), Fishbein's belief-behavior concepts (*34*), Kohlberg's theory of moral development (*47*), impression formation (*81*), attribution theory (*44, 45*), decision-making in children (*12*), Jessor and Jessor's multi-determinant conceptual

structure of problem behavior (*43*), and the concept of risk-taking (*21*) are all examples of theoretical areas that might generate some testable hypotheses in this area of smoking.

Still another important area of research would be to explore the interrelationship of the initiation of smoking in children with other health behaviors. For example, some provocative studies (*8, 40*), though not confirmed by other studies such as O'Donnell's (*66*), suggest that smoking may be a "drug entrance ticket." Children who begin smoking are more likely to begin using alcohol and hard narcotics. Certainly, a careful examination of such types of health-behavioral interrelationships would be a crucial area of research. Likewise, how does smoking relate to the over-all lifestyle of the developing child? A look at the "natural development" of the smoker, perhaps even completing a few studies, such as those the Jessors (*43*) have done with drug usage, which examine very small samples of children over time, might generate a number of significant hypotheses.

However, as is being demonstrated in at least one current investigation (*31*), useful intervention programs might already be developed which may have a better chance of having a long-term impact on the smoking behavior of adolescents than the largely fear-arousal, impersonal, information-oriented approaches generally used. Virtually all investigations in this area report that adolescent smokers and nonsmokers alike really believe that smoking is potentially dangerous to one's health (*34*). Obviously, this fear does not appear to be enough to deter the onset of smoking or to be sufficiently successful in motivating smokers to stop (*31*). Therefore, other types of emphases in prevention programs should be developed. Such intervention programs should apply the method of successive approximation. At each step of the way, the target population of children or adolescents should provide input into the content of the intervention within the context of an appropriate psychosocial, conceptual framework. All intervention materials should be pretested on the children.

Whatever the content of the intervention program, great care should be taken to plan and utilize an adequate evaluation methodology. Failure to incorporate rigorous evaluation procedures emerges as a significant limitation of virtually all of the intervention programs reviewed. One particularly troublesome problem in evaluation methodology deals with the appropriate criterion for the impact of a program. Measures of information about smoking, attitudes towards smoking, or self-reports of smoking may not be adequate indicators of a program's impact. Serious questions are raised in contemporary social psychological literature (*30, 32*) concerning the relationship between information gain and attitude change and behavior. It would be most unfortunate to conclude that a demonstration of the presence of increased information about smoking dangers or an attitude change toward smoking has necessarily had a significant impact on smoking behavior.

Furthermore, as smoking among children and young adolescents is a taboo and socially unacceptable behavior in many social settings (e.g., in schools), self-reports of smoking may be inaccurate.

The majority of the investigations reviewed, whether they are examinations of psychosocial factors, surveys, smoking informational campaigns, or in-school educational programs, rely heavily upon self-report measures of smoking. Investigators (*73*) in the behavioral science literature describe the existence of an acquiescience or interpersonal expectation effect; that is, subjects report what they believe the experimenter expects whether or not it is a true reflection of their actual behavior. Dunn (*22*) questions how much credence can be given to the introspective reports of smokers. He states: "Factors such as the need for social approval of opinions and actions, the need to justify a preference commitment, order of presentation effects, brand imagery effects, halo effects, and the yea-saying tendency are collectively more determinative of a report of a smoke-induced sensory experience than is the sensory experience itself" (p. 98). Although this statement refers principally to self-reports of motivational factors in smoking, many of the same points can be applied to questioning the validity of self-reports of smoking itself.

Obviously, measures of smoking behavior that are more objective than self-reports of smoking are vital for a valid evaluation of programmed treatments. One such measure has been reported (*28, 31*). This involves the use of a procedure which appears to increase the validity of self-reports of smoking behavior. A mass spectrometric analysis of nicotine-in-saliva (*39*) is used to increase the validity of self-reports. Films depicting this analysis procedure are shown to students before they have produced a saliva specimen and before they are requested to record self-reports of their smoking behavior. This results in significantly more reports of smoking. Other investigators (*74*) are exploring the use of chemical indicators of smoking. However, using only direct chemical indicators as the major dependent measures may be too costly or may only be recording recent smoking. For example, nicotine, because of its "half-life" when measured in the blood, records smoking for only a very brief period (*28*). Developing improved techniques for more direct measurement of smoking is clearly an important area for future investigations.

Finally, future research and prevention programs should address themselves to the problem of establishing a truly long-term impact. Many smoking prevention programs often report optimistic success rates. The reporting of such success rates should be qualified by the possibility of the individual beginning to smoke at some later time. Inferences about the evolution of smoking suggest that by the end of the ninth grade very few adolescents are confirmed smokers. The critical level of the onset of confirmed smoking appears to be in high school (*88*). Therefore, the true impact of any deterrence-of-smoking

program with adolescents may not even be measurable until after the adolescent has entered high school. This problem is not unlike the backsliding or recidivism encountered in virtually all smoking cessation programs (*71, 83*).

Thus, in recommendations for future research and in the development and implementation of prevention programs with children and adolescents, the range of possibilities appears vast. Perhaps with a focus on the initiation of smoking, much critical new knowledge of the developing life style of children and adolescents will also emerge. Surely, smoking must be regarded within the total context of the individual's development. Perhaps the real question to be answered is: why do we knowingly choose to engage in self-destructive behavior when so much of our energy is directed toward preserving our lives?

Smoking in Children and Adolescents: Psychosocial Determinants and Prevention Strategies: References

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