Chapter 5
Prevention

CONTENTS

Marketing Smokeless Tobacco: Implications for Preventive Education[1]

Carol N. D'Onofrio

ABSTRACT Efforts to prevent smokeless tobacco use are essentially reactions to a problem created by the tobacco industry. Although the public health community has applied lessons learned from 25 years of progress in preventing cigarette smoking, current preventive efforts do not adequately counteract aggressive product marketing. In spite of fundamental differences between health education and commercial marketing, examination of the industry's success can stimulate new ideas for ST education. Such analysis also reveals some idiosyncrasies of the public health culture that may now limit the effectiveness of interventions to prevent ST use.

INTRODUCTION The marketing of moist snuff in the United States has been profitable for the U.S. Tobacco Company. After snuff was packaged in round tin cans, sales more than doubled between 1974 and 1984 (Bantle, 1980; Negin, 1985). In 1983, the introduction of snuff in small premeasured pouches boosted sales still higher (Dougherty, 1984; O'Connor, 1983; Tobacco Reporter, 1983). The company gained entry to the Fortune 500 in 1985, showing the greatest profit margin of any company its size or larger (Business Week, 1986; Mintz, 1986; U.S. Tobacco, 1985). During the past 6 yr, snuff sales and profits have continued to climb (FTC, 1991; Smith, 1989), moving U.S. Tobacco up 81 positions in rank among the Nation's 500 largest corporations (U.S. Tobacco, 1988 and 1991). Citing its financial strength and proven business strategy, the company confidently forecasts continuing growth (U.S. Tobacco, 1990). Other sources concur, observing that increased bans on cigarette smoking should benefit the ST industry (Deveny, 1990; Ellis, 1989; Smyth, 1989).

Although this record is celebrated in the business world as a spectacular success, health professionals view it with alarm. Tobacco contains known carcinogens, and the link between snuff use and oral cancer has been firmly established (IARC, 1985; Mattson and Winn, 1989; Office of Medical Applications of Research, 1986; US DHHS, 1986; Winn et al., 1981; WHO, 1988). Sharp increases in ST use portend the emergence of a major public health problem.

Fortunately, lessons learned from 25 yr of progress in the prevention and control of cigarette smoking (US DHHS, 1989) have been applied to smokeless tobacco with little delay. Scientific evidence about the health consequences of snuff dipping and tobacco chewing has been consolidated, reviewed, and publicized (IARC, 1985; Office of Medical Applications of Research, 1986; US DHHS, 1986; WHO, 1988). Legislation has banned ST advertising in the broadcast media, required warning labels on product packages and advertisements, restricted the sale of ST to minors in many

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states, and increased taxes on ST products (Connolly et al., 1986; Deveny, 1990; US DHHS, 1989 and 1990a). Research has been funded to develop and test interventions to prevent ST use and encourage cessation (US DHHS, 1990b). In addition, many health agencies and professional groups have produced educational materials for use in schools and community-based tobacco control programs. Work in these areas continues.

Experience from antismoking campaigns indicates that, if these efforts can be sustained, advances in science, policy, and public education will slow the increase in ST prevalence (US DHHS, 1989; Warner, 1982, 1986, and 1989) and eventually turn the tide toward a decrease. However, there will be a time lag, in part because of activities of the ST industry. Research on the carcinogenic properties of ST and the health effects of its use will be complicated by the continual introduction of new products and product variations. Resulting gaps in scientific knowledge will be cited to confound debates about additional policy proposals. Public education will struggle not only against competing priorities in schools, communities, and the media, but also against relentless ST marketing. Moreover, public health workers in each of these areas will compete with each other for scarce resources, while the ST industry will easily finance its expansion through fat profits.

These realities imply that current public health strategies for preventing and controlling ST use must be bolstered by creative new approaches. Because promising directions for basic scientific research, public policy, and cessation programs are discussed elsewhere in this monograph, this paper concentrates on preventive education. First, the need for innovation is emphasized through a brief review of current educational efforts and what they can accomplish. This analysis is then contrasted with ST marketing to identify some specific deficiencies in education, as well as some unconventional ways they might be remedied.

CURRENT PREVENTIVE EDUCATION

At present, education about ST includes public information, educational programs for youth, and some related education of teachers, parents, and health professionals. Most youth education is delivered through schools, often in conjunction with education aimed at smoking prevention. No national data are available on the extent or quality of school-based instruction about ST, but it certainly is less adequate than antismoking education, which itself is highly variable (D'Onofrio, 1989; US DHHS, 1989 and 1990a).

Many schools provide no health education course or regularly scheduled time for health education in the curriculum. In *some* schools, *some* teachers discuss various health topics in science or other courses, but instruction is not systematic and tobacco use may not be covered. Schools with organized health education programs generally teach about tobacco and other substances in a special unit. Alcohol and illicit drugs usually receive the greatest attention, although cigarette smoking causes more deaths annually than all other substances combined (Warner, 1987). Smokeless tobacco receives still shorter shrift; for example, when a single 50-min class period covers tobacco in all forms, it is likely that smoking, not

smokeless tobacco, will be emphasized. In the war on drugs, most of the nation's schools do not identify tobacco as a major enemy.

On the positive side, several state-of-the-art ST prevention programs have been developed and field-tested through research grants from the National Cancer Institute (Boyd and Glover, 1989; US DHHS, 1989 and 1990b). These programs tend to parallel the more effective smoking prevention programs in that they are guided by a social influences model of smoking initiation and are typically directed to children between the ages of 10 and 14. With the exception of a program for 4-H Club members in California and one for Little League baseball teams in Texas, NCI-sponsored prevention programs are conducted in school classrooms by specially trained health educators, college students, or regular teachers, sometimes with the assistance of peer leaders. Their objectives are to provide information about the short-term health and social consequences of ST use; correct misconceptions about the pervasiveness and social acceptability of the practice; reveal how parental modeling, peer pressure, and the media promote ST use; and teach resistance skills. Although evaluation of these programs is still under way, preliminary analyses suggest that, like most theory-based smoking prevention programs (Botvin et al., 1990; Ellickson and Bell, 1990; Evans et al., 1981; Flay, 1985; Flay et al., 1985 and 1989; Gersick et al., 1988; Glynn, 1989; Graham et al., 1990; Hansen et al., 1988a and 1988b; Johnson et al., 1986; Luepker et al., 1983; Murray et al., 1988 and 1989; Pentz et al., 1989a and 1989b; Schinke and Gilchrist, 1984; Telch et al., 1982), they will have positive albeit modest effects on youth least likely to use tobacco.

Although early smoking prevention programs failed to show behavioral effects (Flay, 1985; Thompson, 1978), results from the first generation of ST prevention studies are encouraging. Knowledge gained from efforts to prevent cigarette smoking over the past quarter-century (US DHHS, 1989) has been well applied to the ST problem. A challenge for the future is to promote adoption of NCI-sponsored programs as they become available for widespread use by schools and other organizations serving youth. The first of these projects is now being disseminated (D'Onofrio et al., 1991), and others will soon follow.

As these materials are used and others are developed, a second challenge will be to assure that the principles that led to progress continue to be applied. Thus (1) program design should be guided by behavioral theory, (2) content should extend well beyond the health dangers of ST use, (3) participatory instructional methods should be used, (4) young people should have an opportunity to develop and practice skills for resisting temptations to use ST, (5) teachers should be trained in program delivery, and (6) as appropriate, same-age or older peers should be recruited and trained to assist (Glynn, 1989).

HEALTH EDUCATION vs. MARKETING

Despite early indications that preventive education is on a promising track, current educational efforts pale in comparison to ST marketing. To a certain extent this will always be the case, for health education and marketing differ in several fundamental respects.

The goal of the smokeless tobacco industry is to enlarge the market for its products, while each company aims to improve its market share. Increasing sales by a few percentage points is regarded as a triumph. Public health, on the other hand, tries to protect entire populations. Because preventive education is evaluated against this absolute standard, programs that reduce tobacco use by a few percentage points are viewed as only marginally effective.

Marketing goals are expressed in positive terms like "increase, capture, build, and acquire." These words convey and invite initiative. However, in aiming to "reduce, curtail, decrease, and delay" ST use, the goals of public health carry negative connotations. These differences are reflected in themes and messages used in marketing and health education campaigns. Whereas tobacco advertising urges positive and expansive action ("buy this, try that"), health education warns, "don't do it."

A marketing campaign is initiated by a single corporation after a long period of careful market analysis and product development. The campaign typically is planned to run for several years, with intermediate objectives delineating shorter phases within a well-orchestrated long-term strategy. Resources are assured to execute the plan, which is sufficiently flexible to respond to unanticipated threats or opportunities. Marketing budgets are generous. In 1989, ST manufacturers spent $81 million advertising and promoting their products (Federal Trade Commission, 1991).

In contrast, health education is conducted by multiple agencies, groups, and individuals with a vast array of objectives and priorities. These priorities, the resources available to support them, and organizational leadership shift with economic and political currents. Health care professionals who recognize the need for initiatives to prevent ST use must struggle in this milieu to convince others that a problem exists, but agencies differ in the amount and quality of scientific evidence they require to include ST on their agenda. Once an agency has acknowledged the problem, competition for resources begins.

Agency plans for preventive education frequently are prepared for review by fiscal decisionmakers. Program objectives are shaped not only by the degree to which agency executives and staff understand the ST problem and state-of-the-science approaches to prevention, but also by the agency's mission, commitments, assets, constituent expectations, and time pressures. Optimal proposals for prevention therefore tend to be compromised in the budgetmaking process. Once plans are approved, implementation is expected to begin immediately, often with little regard to what others are doing.

Because agencies tend to plan independently, local, state, and national resources for the prevention of ST use are accumulated sporadically. Educational programs and materials enter the field in an unsystematic and unpredictable flow. These interventions vary in the effectiveness with which they target key issues in prevention, and many of them have not been field-tested or evaluated prior to broad distribution. Although companies that

market ST carefully select and limit their product lines, educational approaches to prevention proliferate with little quality control.

These factors complicate the knitting of fragmented educational elements into a coordinated master plan for prevention. When planning can be accomplished, the result is not streamlined or efficient, but at best a patchwork. In this pluralistic society, institutional autonomy is protected, and enthusiasm for close interorganizational collaboration is frequently lukewarm.

Commercial marketing and health education also differ in the products that they offer. ST products are tangible and cheap; good health education is neither. Moreover, while ST fosters habituation and dependence, health education promotes independence, active decisionmaking, and informed choices. If marketing persuades youth to try ST enough times, nicotine helps to recruit permanent customers (Boyd et al., 1987; US DHHS, 1990b; WHO, 1988). Health education is directed to a more fundamental and continuing change called learning.

Nevertheless, those who market ST are clever in applying learning principles and appealing to the basic needs of children and adolescents. Advertising promotes the fantasy that, with just a can of snuff or a pouch of chew, young people can satisfy their curiosity, demonstrate their maturity and independence, enjoy adventures, belong to an admired group, and enhance their social image. Youth must be highly sophisticated to view the development of resistance skills as an achievement. And of course, learning how to resist temptation, defer gratification, communicate effectively, win friends, and make good decisions is much harder than taking a dip or a chew, especially when the tobacco industry provides free samples and step-by-step instructions for use (Ernster, 1989).

Finally, ST marketing and health education are separated by deep differences in the values and ethics that underlie attempts to influence behavior. Human concern and conscience preclude health educators' promoting products that harm the consumer and from using some strategies that are effective in building business profits.

IMPLICATIONS OF ST MARKETING

Education to prevent ST use is essentially reactive to a problem created by the tobacco industry. For most of this century, the ST market was stagnant or shrinking (Tye et al., 1987; US DHHS, 1986). National surveys conducted between 1964 and 1975 found the prevalence of ST use to be fairly stable at less than 5 percent and use rates to be highest among persons over age 50 (US DHHS, 1986). However, in the early 1970's, the industry extended its product lines and began aggressive marketing to males between ages 18 and 30, with a "substantial emphasis on the 18 to 24 group" (Maxwell, 1980).

The results have been well documented. Dramatic increases in advertising budgets for moist snuff were soon paralleled by sharp increases in production and sales (Rosenthal, 1985; US DHHS, 1986). National surveys of adults conducted between 1985 and 1987 found startling shifts in patterns of ST use, with older adolescents and young adult males using the

products at a higher rate than any other age group (Marcus et al., 1989; Novotny, et al., 1989; Orlandi and Boyd, 1989). Although the ST industry has steadfastly insisted that its products are meant for adults, national and regional surveys also have reported high rates of use among young boys and adolescents (Bauman et al., 1989; Boyd et al., 1987; Glover, 1986; Orlandi and Boyd, 1989; Rouse, 1989). And whereas earlier ST use was largely restricted to rural areas in the South and the West, it is now reported in all regions of the country (Orlandi and Boyd, 1989).

The ST industry, health professionals, and other analysts all recognize clever and aggressive marketing as a major force in these changes (Christen et al., 1982; Connolly et al., 1986; Deveny, 1990; Glover et al., 1981 and 1982; Hunter et al., 1986; Shelton, 1984; Smyth, 1989; US DHHS, 1986; U.S. Tobacco, 1985; WHO, 1988). Sophisticated marketing is also identified as a major obstacle in achieving national health objectives for the prevention and control of tobacco use (US DHHS, 1990a). Detailed descriptions of the creative strategies employed by ST companies can be found in industry publications, trade journals, news magazines, and the health literature (Anderson et al., 1979; Braverman et al., 1989; Christen et al., 1982; Connolly et al., 1986; Deveny, 1990; Dougherty, 1984; Ernster, 1986 and 1989; Feigelson, 1983; Glover et al., 1981 and 1982; Harper, 1980; Maxwell, 1983; Mintz, 1986; Negin, 1985; O'Conner, 1983; Rosenthal, 1985; Shelton, 1982; Tobacco Reporter, 1983; US Tobacco and Candy Journal, 1987).

Those responsible for preventive interventions have used this information to understand the parameters of the problem, to estimate its magnitude, to identify fruitful policy directions, and to acquaint youth with persuasive advertising strategies. To date, however, knowledge about ST marketing has not been systematically applied either in the design of counteractive educational programs or in evaluation of current educational efforts.

Such omissions leave health education continually defending against aggressive ST marketing teams that are committed to keeping the competition under fire. To increase the chances for success, health educators need to study the opposition, strengthen their defense, and develop new offensive moves. As the following examples illustrate, examining secrets of the industry's success can stimulate new ideas for ST education and reveal some idiosyncrasies of the public health culture that may be limiting the effectiveness of current approaches to prevention.

Market Research Commercial marketing invests heavily in research and product testing *before* a campaign is launched. Once a campaign is under way, its effectiveness is evaluated very simply by changes in sales. In contrast, public health provides few resources for market research to guide the design of educational programs. Health education is initiated as soon as possible and then subjected to rigorous evaluation. To do it right in public health, educational interventions must be subjected to longitudinal randomized trials in defined populations with biochemical validation of self-reports and

appropriate units of statistical analysis. The effectiveness of ST use prevention might be increased through a shift of resources from extensive evaluation of educational programs after they are delivered, toward more front-end research to guide initial development and refinement.

Market Definition Although the ST industry has identified males aged 18 to 24 as its primary marketing target (Maxwell, 1980), public health researchers have assumed that prevention will be most effective during initial experimentation with dipping and chewing. Because the onset of cigarette smoking peaks during the transition from elementary to middle or junior high school (Flay et al., 1983), resources for ST education have been concentrated on those aged 10 to 14. The need for preventive programs for younger children is now recognized, but older adolescents and young adults are discussed only as targets for ST cessation.

Nonetheless, among adults who use ST regularly, the median age of initiation for both snuff and chewing tobacco is 19 (Novotny, 1989). Although this figure may drop with the maturing of youth who grew up and began to use ST during intense marketing, it suggests that the initiation of ST use may occur throughout adolescence and into early adulthood. Preliminary data from a California survey (California Department of Health Services, 1990), presented in Table 1, further indicate that many young adults who dip and chew are not yet addicted to daily use. Preventive education, therefore, should be directed not only to children and young adolescents, but also to high school students and to young men making the transition into college or the workplace. Like ST marketing, health education should especially target young men entering blue collar occupations in factories, on farms, or in industries such as lumber, steel, fishing, and firefighting.

Market Segmentation Smokeless tobacco marketing is precisely targeted. According to an executive of U.S. Tobacco:

> We've built our business by identifying the "pockets" of Americans whose lifestyles include smokeless tobacco . . . . Other consumer product companies are beginning to realize what we've understood all along. America is not necessarily a "mass-market"; it is more a collection of "micro-markets" or regional markets defined by a variety of factors (including age, sex, occupation, and hobbies), which may be broadly defined as consumer "lifestyle" (Africk, 1985).

To date, education to prevent ST use has been only modestly adapted to reach different segments of the youth population. Current projects with 4-H, Little League, and Native Americans provide an important start in tailoring prevention programs to the groups at high risk for ST use. However, within these market segments, youth are still treated very much alike. Health education thus needs to seek additional sites and alternative models for preventing ST use among youth at greatest risk. Like U.S. Tobacco, we should learn to "fish where the fishing is good" (Deveny, 1990).

Table 1
Current use of smokeless tobacco as a weighted percentage of California males, aged 18 to 44, who have ever used chewing tobacco or snuff

	Age 18 to 24	Age 25 to 44
Chewing Tobacco		
n	172	393
Daily use	4.5%	6.6%
< daily use	18.9	9.6
Snuff		
n	141	318
Daily use	7.9%	8.5%
< daily use	11.8	9.1

School-based programs treat all students as potential users, but most girls and many boys do not like ST and never intend to use it. Teaching such youngsters skills to resist ST offers probably is not the best use of educational time and resources. The limited effectiveness of school-based programs in preventing high-risk youth from using tobacco raises questions about optimal use of classroom time. With increasing pressures on their curricula, some schools already are reluctant to commit multiple sessions to tobacco education. Youth groups that hold only weekly or monthly meetings also hesitate to devote a high proportion of their program time to prevention of tobacco use. Ironically, this problem will be exacerbated if rates of cigarette smoking and ST use among young people begin to fall.

Maintaining and increasing the support of schools for preventive education thus requires the development of programs that are relevant to all youth served and that advance basic organizational objectives. One possible approach is to emphasize the rights of individuals to a tobacco-free environment and to present tobacco use as a social as well as a personal health issue. Some programs already are teaching children how to ask others not to use tobacco in their presence, to discourage friends from trying tobacco, and to support users who are trying to quit (D'Onofrio, 1991; D'Onofrio et al., 1991). Development of these skills in communication, social relations, and social problem-solving nurtures children's development while simultaneously establishing their social identity as non-users of tobacco.

An extension of this approach is to involve youth as active partners in the planning, delivery, and evaluation of school- and community-based prevention programs. Their creativity should be tapped in the design and production of educational materials and presentations. Young people should testify at city council meetings on proposed tobacco control ordinances. They should appear on radio and television to debate the issues, discuss their efforts, and showcase the songs, poems, skits, and artwork they have produced. They should be recruited to help with surveillance of ST promotions. Youth also can participate effectively in sting operations to identify merchants who illegally sell ST or distribute free samples to minors.

Assuming responsibility for adult tasks satisfies young people's curiosity, fosters their maturity and independence, provides them with new experiences, and enables them to affiliate with admired adults, including doctors, dentists, attorneys, community activists, media and sports personalities, law enforcement officers, and others. Recognition of their capabilities and talents also enhances the self-image of youth, while participation with others in the fight against tobacco deepens their sense of community and creates future leaders. By responding to the developmental needs of children and youth, these activities lead to outcomes that are widely recognized as protective against all forms of substance use (Hawkins et al., 1985).

Product Development

U.S. Tobacco tailors its products to promote their acceptance. Packaging snuff in round tin cans was instrumental in increasing consumer awareness: having a round can of snuff in the back pocket of blue jeans became a status symbol among young males (Negin, 1985). Skoal Bandits were designed to provide new users with a gradual introduction to moist snuff, as well as to overcome some of the messiness associated with ST use and to increase its acceptability in the urban environment (Bantle, 1980; Dougherty, 1984; Maxwell, 1983; Negin, 1985; O'Conner, 1983). Prevention programs might similarly benefit from more creative packaging to attract interest, and from product diversification to encourage easy trial, which leads to more regular use of stronger products. However, to avoid dilution of educational efforts, such initiatives should be part of a larger strategy designed to promote eventual adoption of more potent programs.

Another industry principle that merits consideration is product variation to assure consumer choice. Both ST products and the strategies used to market them are tailored to diverse tastes and customs. The public health community, though, attributes great importance to the generalizability of preventive programs and their potential for widespread acceptance. Possibly, tailoring health education programs to a variety of micro-markets would prove more effective than developing generic programs for mass distribution. An additional principle borrowed from the ST industry indicates that such innovations may win quicker acceptance if they are introduced not as new educational products, but as extensions of programs already known and popular (Smyth, 1989).

Product Distributors

U.S. Tobacco considers its sales force a key component of success. Nationwide in 1986, the company had 436 field representatives who provide retailers and customers with one-on-one attention (U.S. Tobacco, 1986). Specific functions include assuring fresh products, promoting optimal display, demonstrating use, obtaining customer feedback, and identifying potential areas for development (Deveny, 1990; U.S. Tobacco, 1986 and 1990). These salesman also court retailers with recognition, prizes, tickets to sporting events, and invitations to social gatherings.

In addition, representatives of U.S. Tobacco serve as "traveling billboards" for the company (Hawkins et al., 1985). Like chameleons, they adapt to the local culture and provide exciting in-the-flesh advertisements for chewing and dipping. We have encountered a salesman in southern California driving a red Ferrari. In Bakersfield, a sales representative in a

hard hat was observed distributing free samples in the oil fields. And in a rural mountain county, we found an ST representative wearing a cowboy hat and driving a pickup truck with country-and-western music on the radio and a can of Copenhagen on the dash.

Those who market prevention programs rarely display such cultural adaptability or such verve. Too often, these programs are simply delivered to schools and other organizations with the expectation that they will be used. Given numerous barriers in program dissemination (D'Onofrio, 1989; Glynn, 1989), employing field representatives to nurture the adoption process appears worth a try. As far as possible, these distributors of prevention should establish warm relations with program intermediaries and consumers. In addition, their manner and their personage should demonstrate that tobacco-free lifestyles are both accessible and exciting to youth and young adults within the context of unique community cultures.

Development Of the Delivery System

The promotion of smokeless tobacco is pervasive and continuous. However, prevention education typically is presented only at schools and for a limited time. To counter subtle, sophisticated, and omnipresent promotion of tobacco products, adults who spend time with children should be enlisted in the preventive effort. Ideally, they should provide education spontaneously as issues about the sale, promotion, and use of smokeless tobacco arise in the course of daily life (D'Onofrio, 1991). That is, when parents, youth leaders, and others observe ST being used, they need to discuss the practice as dangerous and socially unacceptable. During visits to the corner store, attendance at baseball games and other events, or while watching the Indianapolis 500 on television, adults should point out how ST is marketed. In these conversations, adults also need to help children understand why a bad product is so readily available, why some good people use it, and why the Government does not ban substances that are harmful. Answering children's questions about ST is likely to require explaining history, politics, government, law, economics, and other complex aspects of society.

The educational challenge is formidable, but if young people are to make wise decisions about ST, both as individuals and as community members, adults in all walks of life must rise to the task. Nurturing the positive development of children and youth through education is public health's most powerful approach to prevention.

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Applying the Social Inoculation Model To a Smokeless Tobacco Use Prevention Program With Little Leaguers[1]

Richard I. Evans, Bettye E. Raines, and J. Greg Getz

ABSTRACT This paper first considers the question of how research on smoking prevention among adolescents can become the basis for developing programs to prevent the use of smokeless tobacco. Within this context, the evolution of the social inoculation strategy is discussed. The paper encompasses procedures we used in developing, implementing, and evaluating such programs, drawing from our current National Cancer Institute-supported project dealing with prevention of ST use among Little League baseball players. Recommendations for public policy related to prevention of ST use are offered.

INTRODUCTION The invitation to this conference provides an opportunity to describe how health promotion investigators, employing a social influence orientation, can consider the cross-application of well-studied models from cigarette smoking to the emerging problem of smokeless tobacco use. To introduce the discussion, we describe the evolution of the "social inoculation strategy" originated by our research group to prevent cigarette smoking among adolescents (Evans, 1976; Evans et al., 1978 and 1981). Variations of this approach have been extended to the prevention of use of harmful substances such as alcohol and illicit drugs (Botvin and Wills, 1985; Flay, 1985), suggesting that its application to preventing ST use may help meet stated research goals (Chassin et al., 1989; Evans and Raines, 1990). Our current NCI-supported ST use prevention program, which involves a large population of Little League baseball players, is designed to test the efficacy of such a cross-application (Evans and Raines, 1990).

We emphasize both psychosocial and methodological barriers to the successful development, implementation, and evaluation of tobacco use prevention programs, drawing on our broader program of health-related research and on the Little League baseball project specifically for examples. We define methodological problems to include the structural-organizational barriers inherent in research conducted in natural settings.

While we are pleased that our approach has proved valuable in prevention efforts, we are concerned that one technique of this overall prevention strategy—"Just Say No" to resist peer pressure—has been taken out of context and redirected in simplistic form as a formula for preventing all substance abuse. In our original program, "Just Say No" was presented as a resistance response to low-level peer pressure and was only one of a series of

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responses and strategies designed to address increasing levels of peer pressure as well as other social influences in the young adolescent's environment. Because of the current pervasiveness of the catchphrase, we emphasize that "Just Say No" is not enough! Such generalized use of a single component of prevention strategy is something about which prevention program planners should be cautioned (Evans, 1988).

EVOLUTION OF THE STRATEGY

Our smoking prevention research program evolved from a series of studies during the 1960's, in which we attempted to apply social-psychological theories and strategies to problems in preventive dentistry (i.e., effective toothbrushing and flossing among a population of junior high school students). The results of these studies (Evans et al., 1970 and 1975) were encouraging, including the successful use of a chemical measure, a tooth-staining disclosant that allowed us to compare the effects on oral hygiene of actual vs. reported toothbrushing behavior (Evans et al., 1968). Several findings from these studies proved useful as we entered the next phase of our research program:

- the probability that reported health behavior may not correlate with actual behavior;
- the observation that fear arousal alone in persuasive messages may not be the most effective means of influencing health enhancement behavior;
- the fact that community institutions such as schools may lend themselves as settings for implementing persuasive health messages in a systematic and controlled manner; and
- the importance of tailoring both content and style of health promotion messages to the target audiences in such settings.

In 1973 we began addressing why young adolescents begin smoking cigarettes even when they are fully aware of the related health dangers. An extensive survey of junior high students in the Houston Independent School District (Evans and Raines, 1982) identified several problems related to preventive education about smoking in the school setting. These problems created barriers to effective communication of important health messages to adolescents. A student survey indicated that smoking prevention programs in the curriculum

- focused too heavily and inappropriately on fear arousal;
- emphasized the long-term consequences of cigarette smoking (e.g., heart disease and cancer), failing to recognize that young adolescents are more present- than future-oriented;
- used audiovisuals (e.g., films, videotapes) and other materials in general use that had not been evaluated for their relevance to adolescents; and
- were predicated on the notion that mere awareness of a health threat leads to the desired health enhancement behaviors.

According to this survey, not only were students unresponsive to such programs, but in some cases, it appeared that the health education messages delivered were *counter*productive.

In addition to the student survey findings, the evaluation of concurrent in-place school smoking prevention programs identified two underlying problems that might be addressed in a well-planned intervention study: (1) Other than their reliance on imparting information about the dangers of a potentially harmful behavior, the programs rarely had any guiding theoretical conceptualization; and (2) in the development of interventions, program planners did not seek feedback from their target audiences.

To address such barriers to the understanding and acceptance of important health messages and, more critically, to elicit appropriate behavioral action as a result of exposure to the messages, we undertook a longitudinal investigation using a large population of junior high school students as they entered seventh grade. Because the development of our intervention strategy is described elsewhere (Evans, 1982, 1984, and 1990; Evans et al., 1984a and 1984b), in this paper we only outline the development of this program.

Results from an initial survey that included fifth- through ninth-grade students indicated a significant increase in experimental cigarette smoking at about the time students entered junior high school. At the time, junior high schools in Houston included grades seven through nine. Thirteen junior high schools were selected for assignment to various experimental conditions, and two were chosen as resource schools to be used in the development and pretesting of procedures and materials.

We established priorities in developing our research program, dictating that (1) it was guided by appropriate theoretical considerations and (2) it reflected input from the target population. In addition to drawing on various psychosocial-behavioral theories and models, which are described in more detail below, we instituted a systematic process assessment of the knowledge, experiences, perceptions, beliefs, behaviors, and terminology of the target audience. From the beginning, we attempted to establish and maintain a feedback loop, which we defined as the linkage between the content of persuasive messages created for disease prevention research programs and data from the target audiences (Evans et al., 1984a). We thus relied heavily on formative evaluation as we developed and implemented our intervention strategies (Evans et al., 1989).

We worked from the premise that tobacco use, although an age-related behavior, occurs most often within the context of social interactions; and although it involves the use of cognitive or knowledge structures, social adaptation appears to override intellectual adaptation or knowledge in decisionmaking. Social learning theory (e.g., Bandura, 1977; Evans, 1989) appeared to be particularly relevant. As applied to smoking initiation, the theory suggests that through observation children acquire expectations and learned behaviors *vis-à-vis* smoking. We considered that vicariously learned positive or negative consequences of cigarette smoking might be important factors in the decision to start smoking. Smoking behavior and expressed

smoking-related attitudes of peers, family, and media figures could be expected to affect the adolescent's smoking-related attitudes, beliefs, values, expectations, and learned behaviors. Young adolescents often perceive smoking as glamorous or as a behavior distinctive to adults. Because people tend to imitate the actions of their models (Bandura and Huston, 1961), we expected smokers in the young person's social setting to have an influence out of proportion to their numbers.

Adolescents tend to overestimate the proportion of individuals who smoke. Subjects in our investigations believed that "almost everyone" in their age group smoked, although the data indicated that only a relatively small percentage actually did (Evans et al., 1984b). Perceptions of group norms, of course, can constitute a vicarious peer pressure in influencing the behavior of adolescents (e.g., Ajzen and Fishbein, 1980; Evans et al., 1988; Fishbein and Ajzen, 1975). Recent studies (Graham et al., 1991; MacKinnon et al., in press) demonstrate that modifying subjects' perceptions of group norms, as a component of prevention programs, may sometimes be stronger than a peer pressure resistance training component. We therefore incorporated modifying perceptions to conform to reality into our social inoculation strategy.

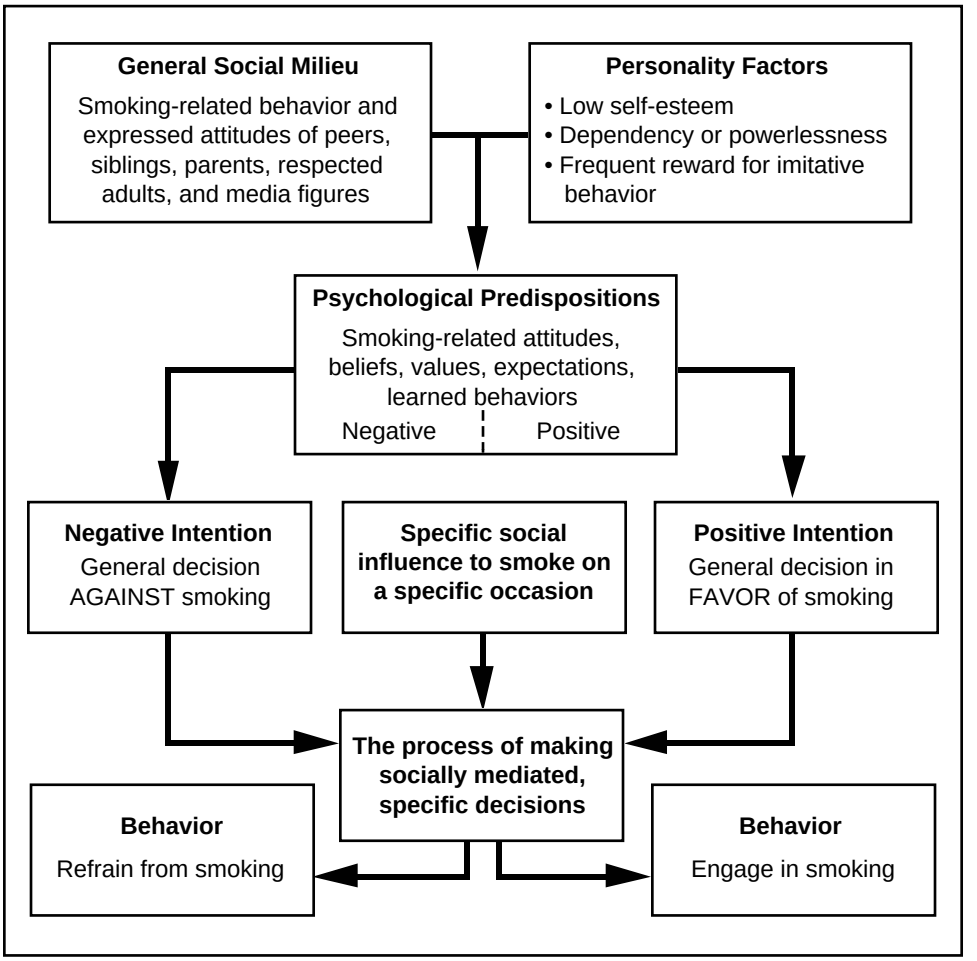
Another concept for addressing the problem of smoking prevention is the theory of reasoned action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). It proposes a framework for predicting behavioral intentions, which are assumed to mediate and thus predict subsequent overt behavior. This approach suggested empirically testable hypotheses that could reveal important components of the development of smoking behavior.

Personality characteristics of the subject may also interact with social influences to encourage smoking. Bandura (1977) lists three characteristics that appear to facilitate imitative learning: (1) low self-esteem, (2) dependence or powerlessness, and (3) a history of receiving frequent rewards contingent on engaging in an imitative behavior.

The model shown in Figure 1 reflects the possibility that both social environmental and personality determinants contribute to the complex of psychological predispositions producing an intention to smoke or to not smoke. The actual decision on a particular occasion may, of course, depend on the effect of situational social influences. Teaching adolescents to cope with such influences might decrease the probability that they will smoke.

Ideally, a prevention program would incorporate all the components of the model reflected in Figure 1. In the development of our research program, however, we encountered time constraints and barriers to access to potential study populations in the school district in which we were working that precluded programs designed to modify the social environment within the schools. Therefore, inoculation against social influences on the individual to smoke became our primary focus. We described this initial social-influences approach in our 3-yr field investigation (e.g., Evans, 1976; Evans et al., 1978; Evans et al., 1981; Evans et al., 1984a) as the "social inoculation strategy."

Figure 1
A model of smoking-related social psychological processes that have impact on behavior

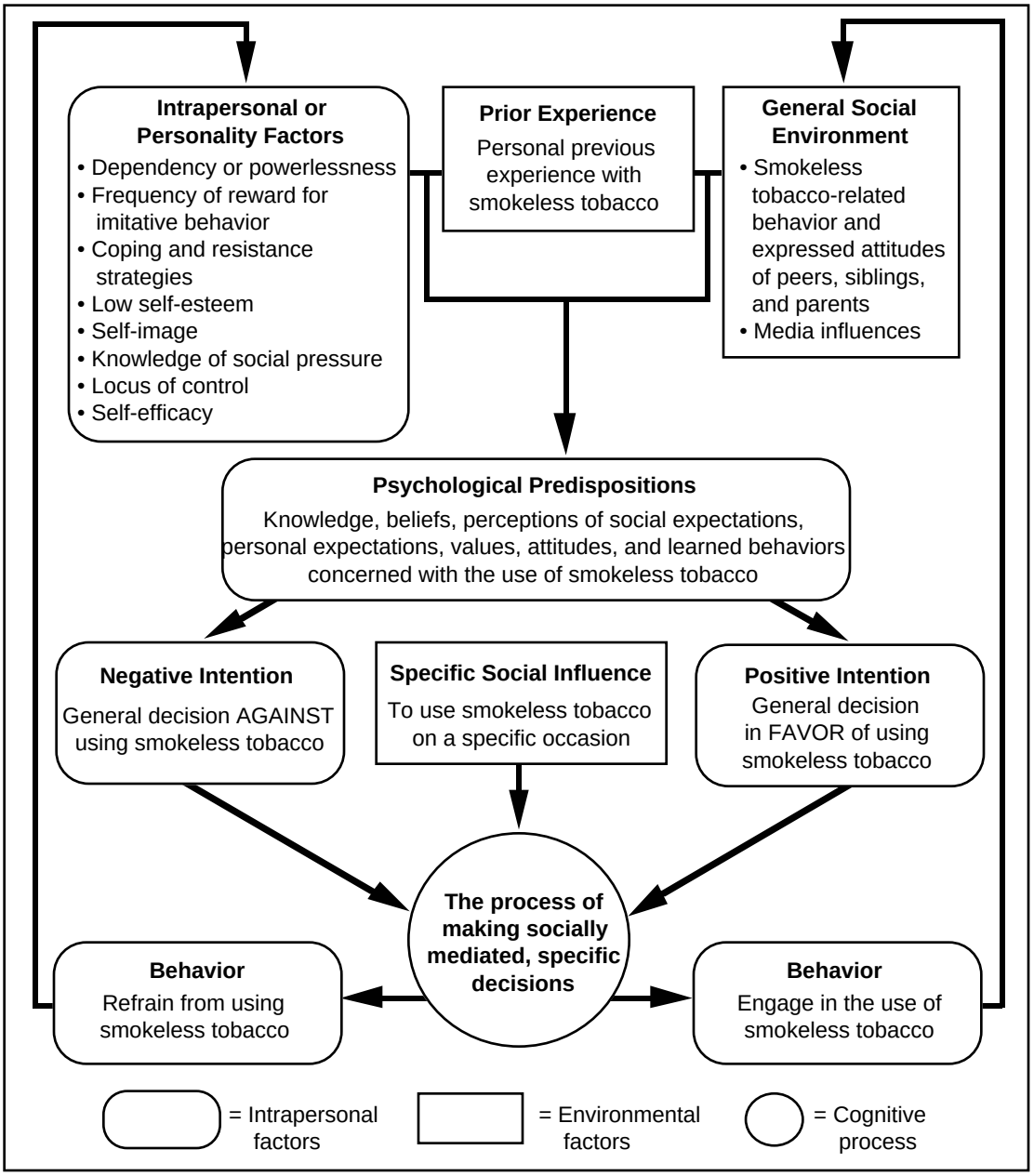


DATA-BASED INTERVENTIONS

In developing our interventions, we tried to create messages to which adolescents would listen and on which they might act. We were guided, to some extent, by Laswell's classic social-communication model (Laswell and Casey, 1946), McGuire's (1969 and 1974) information-processing communication model, and, as previously mentioned, the model of an ongoing feedback loop (Evans et al., 1984a) that allowed specific tailoring of the program to the target audience. (See Figure 2.)

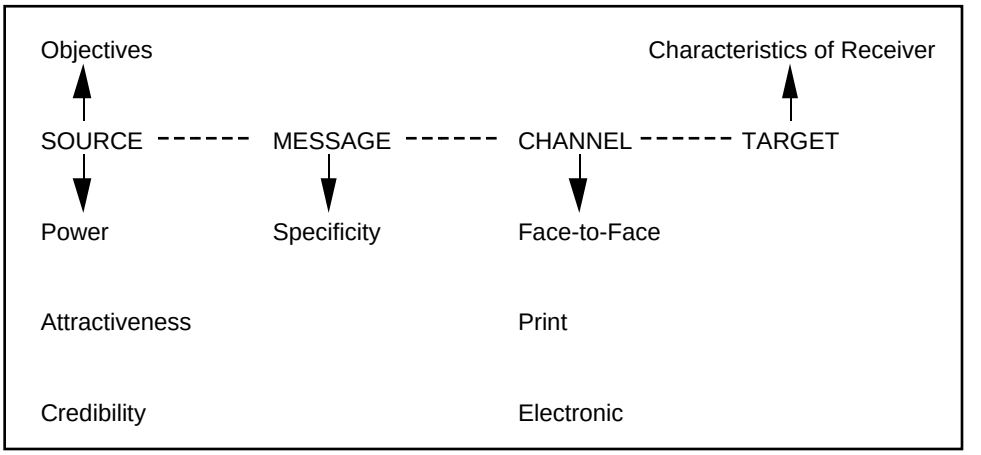
In discussing the development of our interventions, we might first consider the *source* of the communication in terms of Laswell's model. (See Figure 3.) Instead of adults who could be perceived to represent power, which adolescents might reject, our messages were delivered by adolescent narrators, selected for their perceived acceptability by or attractiveness to junior high school students. Although a certain amount of peer credibility

Figure 2
A model of ST-related social psychological processes that have impact on behavior



was inherent in their appearance as actors, in their presentation, the narrators acted as information brokers rather than authority figures. Increased credibility accrued through the narrators' prefacing biopsychosocial information with such phrases as "The researchers have found . . ." or "The researchers have asked me to tell you . . . ."

Figure 3
Synthesis of three social-communication models: external properties



The next component of Laswell's model addresses the *message*. Based on the literature (Janis and Feshbach, 1953; Leventhal et al., 1965; Sutton, 1982) and findings of our previous research (Evans et al., 1970 and 1975; Evans, 1979), that fear arousal does not provide adequate long-term motivation to accept or comply with health-related messages, we relegated fear arousal as only one aspect of our messages. We thus moved away from merely emphasizing the more global approach of the period (e.g., "Smoking is bad for you.") to include messages specific to the adolescent's social and developmental level (Evans, 1979; Evans and Raines, 1982; Leventhal et al., 1965).

McGuire's information-processing communication model (McGuire, 1969 and 1974) was particularly useful in developing our intervention. As indicated by this model, to be effective, messages must be (1) *attended* to and (2) *comprehended*. The content of the message must be (3) *accepted* by the target audience as useful and personally applicable, and it must be (4) *retained* if the individual is to (5) *act* on it, now or later. Obviously, if a persuasive message is to be effective, the audience must attend to it, and it must be couched in language or visual design that can be understood.

Failing to gain attention of the target audience appeared to be a major problem of earlier school-based health education programs. Furthermore, educational materials such as videotapes with a high fear arousal content, as described earlier, emphasized biomedical information (e.g., the physiological effects of smoking on the body or the etiology of cancer) at a level beyond the comprehension of the young adolescent audience. Although the problem is fairly easy to identify, the solution (e.g., effective messages that catch and hold the attention of a seventh-grade student or accurate scientific information at an elementary school reading level) is substantially more difficult. Employing standard educational methodology for reading level assessment, we created persuasive messages and pretested them with students at the resource schools. Their feedback ensured that the language

used was fully understood. We asked students representative of the study population to assist us in writing scripts and acting out role-played situations, using their own words and actions. Our evaluations indicate that target audiences perceive such scenes as realistic.

Although a wide range of media may be effectively employed as channels for persuasive communications with groups (e.g., school classes) (Weiss, 1969), in the early studies described here, pragmatic considerations mitigated for videotape as the primary delivery mode, with printed materials (e.g., posters with scenes from the videotapes) serving as supplements. Videotaped messages could be standardized for presentation across groups and schools, thus averting the problem of differential treatment.

One effect of producing the intervention audiovisuals locally was the target audiences' perceived personalization of the communication. Local scenes on the videotapes (e.g., school campuses, shopping malls) held the attention of the students. Personalization often requires little extra effort by the researcher. In a later multischool, multidistrict study, the students' attention to a standardized sound/slide presentation of health resources in their county was greatly increased when one picture of the specific school was presented as the first slide (Evans et al., 1990).

Following McGuire's model, after attention and comprehension, acceptance and retention of the material are critical. To encourage acceptance, students were urged to become involved in discussions and feedback sessions. Training, rehearsal, and role-playing reinforced personal involvement. A series of "booster" videotapes with supplemental materials such as classroom posters was used over a 2-yr period after the primary treatment series, allowing for the repetition, reinforcement, and reintegration of material required for retention of persuasive messages that might not be acted on immediately.

The messages in the videotapes and discussions were presented so as to reinforce self-attributions and self-determinations of decisions to smoke or not. Throughout the messages, the audiences are told, "You can decide for yourself," or "Here is some information that might help you decide," but they are not given the "correct" decision in a prescribed manner. Process data indicate that students like this low-key, nondirective approach.

In addition to tailoring our intervention as described above, we also employ a concept of *behavioral* inoculation instead of the concept of *cognitive* inoculation that McGuire (1961) directed at restoring or maintaining beliefs and attitudes. In several papers (e.g., Evans, 1982, 1984, 1990), we described this concept as the "social inoculation strategy." The strategy involves increasing resistance to social influences to smoke that children and adolescents encounter by inoculating them with both knowledge and a repertoire of social skills to help them resist such pressures. Included also are such coping responses as "Just say no" to *low* peer pressure to smoke. From the social inoculation strategy orientation, a response to a higher level of peer pressure might be, "I thought you were my friend. Why do you want to give me cancer?" In addition to training adolescents to recognize

and cope with such *overt* social influences to smoke as peer pressure, this approach addresses possible *covert* social influences, such as models who smoke in ads or the individual's perceptions of peer group smoking norms.

THE HOUSTON LITTLE LEAGUE PROJECT

Within the past decade, there has been a significant increase in ST use, particularly among young males (Boyd and Glover, 1989; US DHHS, 1986). As we considered extending our research program into prevention of ST use, a number of factors contributed to the design of our current project, which involves Little League baseball players as the study population. (In fact, current NCI-supported projects are also directed to other special population groups: 4-H Club members and Native Americans.)

- Some evidence indicates that the tendency to use ST relates to the tendency to smoke cigarettes and may involve some of the same psychosocial mechanisms, suggesting that models and methodologies developed for smoking prevention research might be applicable to ST use prevention (Chassin et al., 1989; Evans and Raines, 1990).
- ST use appears to begin at an earlier age than that usually noted for initial experimentation with cigarette smoking (Ary et al., 1987; Bonaguro et al., 1986; Schaefer et al., 1985), suggesting the efficacy of using a target group of preadolescent subjects.
- With the exception of Native American populations, in which females and males report about equal use (Schinke et al., 1986), ST is used primarily by males (US DHHS, 1986), suggesting the selection of a potential study group that is primarily male.
- Heavy ST use appears to be closely associated with the public lifestyle of a significant number of professional baseball players (Connolly et al., 1988), suggesting possible imitative behavior, particularly by sports-minded youth. About 28 percent of our current Little League sample (aged 12 or younger) believes that more than half of professional players use ST. However, this perception is not a strong discriminator between never having used ST and having initiated ST use. It remains to be determined whether perceived use of ST by professional baseball players influences use by older adolescents.
- The widely accepted belief that ST use is a relatively "safe alternative" to smoking cigarettes (Schaefer et al., 1985) has implications at both individual and program levels. Some evidence suggests that such beliefs may increase the likelihood that adolescents who are non-users will take up the practice in the future (Chassin et al., 1985).

  Data from the first wave of our longitudinal investigation (n=1,141) reveal that 23 percent of the Hispanics and 18 percent of the Anglos believe that ST is less habit-forming than smoking. Eighty percent of both Hispanics and Anglos believe that ST use is safer than cigarette use.

  If school administrators and curriculum developers also perceive ST to be safer than cigarette smoking, and program planners perceive ST use

as limited only to males and a lower health risk, there could be less curriculum time and fewer ST prevention research programs (Evans et al., 1990).

- Overt influences to smoke cigarettes appear to be primarily peer influences, actual or perceived (Evans, 1984; Evans et al., 1988). Apparently less important in influencing adolescents to smoke cigarettes, *covert* influences to use ST may come from adult authority figures (Ary et al., 1987), including coaches (Marty et al., 1986), indicating that different resistance strategies may be needed in the setting of athletics.

As a function, in part, of integrating these factors into a longitudinal study design, we proposed a research program that applies our social inoculation strategy to an ST use prevention program for preadolescents (aged 9 to 12) and young adolescents (aged 13 to 15), within the context of baseball-related activities, using as subjects Little League baseball and Senior League baseball players who are, in our area, 95 percent male. Shifting from a school-based setting to the baseball setting allows a concentrated focus on ST use, including correction of misperceptions such as the relative safety of its use, and provides for the involvement of both players and coaches.

The study has the support of Little League baseball at various administrative levels, including endorsement by the national executive director and the Texas state director. At the local level, district administrators and league presidents act as liaisons between our project staff and Little League teams. We also have the cooperation of the local Major League team, the Houston Astros.

The 5-yr project involves three stages:

- An assessment of the psychosocial-behavioral processes involved in the initiation and use of ST among young people, aged 9 to 15, who are members of active Little League and Senior League baseball teams;
- The development of a theory-guided, data-based prevention-deterrence program to be executed within Little League baseball activities; and
- The implementation and evaluation of the prevention program in a 3-yr longitudinal study involving a cohort of Little League players assigned, by team, to program (treatment) or measurement-only (control) condition.

During the initial phase, the cross-sectional survey instrument was developed, pretested, and administered to players in several Little League administrative districts in and around Harris County. Data from the initial cross-sectional survey indicated no significant differences among the participating districts. Therefore, the longitudinal phase involves approximately 180 Little League teams from one large Little League administrative district in Harris County and Galveston County. The geopolitical division of the district allows us to sample teams from both urban and rural areas with a

wide range of socioeconomic markers while maintaining a simplified administrative approach that facilitates cooperation and averts the attrition problems that often plague research studies.

The cross-sectional survey instrument operationalized approximately 20 hypothetical predictors of ST use. With a representative sample of Little League players (n=57) drawn from several administrative districts, the instrument was pretested for comprehensibility by young subjects (< 12 yr) and administration time, including subject attention span and optimal approaches for conducting surveys in field houses or Little League field bleachers. Based on feedback from the pretest, items were modified, combined into a second instrument, and administered, under field conditions, to a second representative sample of Little League players (n=273). In this sample, about 85 percent were male, white, and 12 yr old or younger; 12.9 percent had tried ST at least once; 12.5 percent had tried smoking cigarettes at least once; 2.2 percent had used ST during the previous week; and 1.8 percent had smoked cigarettes during that same period.

The final form of instrument was administered as a cross-sectional survey to a third representative sample of Little League players (n=293; age range, 7 to 15 yr) to help shape the longitudinal measurement questionnaire and to provide content for the intervention program. The overall responses of this sample to four key questions are summarized as follows:

- Players who had tried smokeless tobacco at least once—14 percent.
- Players who answered "maybe" or "yes" to try in future—16 percent.
- Players reporting at least one of their friends uses ST—27 percent.
- Players reporting using ST during past week—5 percent.

It is interesting to note that reported use ". . . during the past week . . .," shown in Table 1, is similar for all three groups, although other substantial differences appear to be age related. It should be noted, of course, that the youngest and oldest groups are fairly small subsamples.

At present, we are carrying out the second year of the Little League longitudinal study with a longitudinal sample (n=1,141) that was identified at its initial measurement as 94.7 percent male with 99.0 percent of the sample falling between the ages of 8 and 12. As for racial distribution, 74.7 percent are white, 11.1 percent Hispanic, 8.5 percent black, 2.5 percent Native American, and 2.5 percent other.

POTENTIAL BARRIERS

The investigator must be sensitive to the issue of relevance in the design and implementation of any risk-behavior prevention program. For example, our Little League study involves a very diverse population, and interventions must be tailored to a wide range of demographic factors. In a discussion of tailoring risk-behavior prevention programs to special populations, Orlandi (1986) listed several specific problems that we have found relevant to our current study. Below is a brief discussion of some barriers and examples of steps we have taken to address or eliminate the particular problem:

Table 1
Summary of findings from cross-sectional study, by age

	Percentage, by Age Group		
	7 to 8 yr (n=71)	9 to 11 yr (n=149)	12 to 15 yr (n=73)
Reported Use of ST			
Tried it	3%	9%	33%
Will try it	10	13	26
Friends use it	10	18	64
Used it past week	6	5	7

- *Use of language that is unfamiliar or uncomfortable for the target population*—For example, it is sometimes difficult for an academic-oriented researcher to communicate at the level required for interaction with 9-yr-old Little League players from varied socioeconomic backgrounds. As described previously, we use a feedback loop involving children similar to the target group to assess the appropriateness of language in terms of attention and comprehension.
- *Use of printed materials that are too sophisticated*—Printed intervention materials are assessed by a member of our staff who is trained in preparing written material for elementary students. Printed material to be distributed to coaches and parents is reviewed by the Little League district administrator, whose responsibilities include distributing effective written materials for Little League.
- *Using individuals who are not well known in the community*—In our Little League program, we have involved professional baseball players who are well known to Little League players and their adult sponsors. We also have used the resources of the University of Houston baseball coach and his staff, who develop training materials for Little League and are highly respected. At all times, we keep outside communicators or interveners within the context of the game of baseball.
- *Using unfamiliar motivational devices*—In the Little League study, we use motivational devices to encourage full participation and continued participation in the study. Motivational devices range from cold drinks, if the program is being implemented during hot weather, to free tickets to an Astros or University of Houston baseball game (tickets were provided by the Astros or Houston Cougars). A major motivator during the critical first year (when at least 75-percent team participation was required for all testing and intervention occasions) was a set of Skills and Drills Training Videotapes produced by Dr. Bragg Stockton, coach of the University of Houston baseball team. The videotapes were a highly significant motivator, and each League that met the 75-percent criterion for participation received a set.

- *Conveying the impression that the program is not intended for long-term adoption or that community leaders are not expected to participate*—From the beginning we have made it clear that the final, evaluated program will be available to Little League baseball for general distribution. Little League district personnel provide continuous feedback to the research staff. Our field coordinator is a Little League district administrator with more than 25 yr of experience. The state director acts as a consultant to the program.

A major barrier to developing ST use prevention programs is the perception that ST is relatively harmless in comparison with other drugs. Although all of the communities where we are working have active drug abuse prevention programs (e.g., Chicken Club, Just Say No Club) to which community members contribute time and financial resources, many individuals do not perceive ST, cigarettes, or alcohol as drugs in the same category as the illicit drugs emphasized by many of the community programs. Most of these issues suggest the importance of developing and maintaining rapport with the organizations participating in the project. To address this issue, we are presently developing a videotape with the theme, "Tobacco is a drug, too!"

A frequent barrier found by health promotion investigators is the sample biasing effects of stringent informed consent measures that often have been reported for both measurement and intervention components (e.g., Evans et al., 1977). In our present school-based projects, we have gained the consent of the school districts involved to include the prevention program as part of the regular Texas Education Agency-approved curriculum. Under these guidelines, measurement and intervention activities can proceed at the discretion of the school superintendent and the advisory school board, given that all procedures and materials meet the guidelines of the Texas Education Agency and the school district. The Little League program involves obtaining parental consent. However, parents of the players attend games and practice sessions and are generally far more available for providing consent than is usual in school- or other community-based programs. To date, we have not encountered serious problems gaining informed consent for Little League players.

A taboo on any behavior (e.g., illicit drug use or, in the case of children and adolescents, the use of alcohol or tobacco) remains a barrier to reliable measurement of that behavior. To address this problem in our studies, we emphasize the strict regulations regarding anonymity and confidentiality and use strategies that have been shown to increase the validity of self-reports. Such strategies include the collection of saliva specimens under "pipeline" conditions, a procedure we had developed earlier (US DHHS, 1986).

Many researchers place an emphasis on summative evaluation and, under constraints of time or funding, ignore the formative evaluation procedures that frequently are valuable in the development of interventions and measurement instruments. Providing for continuous feedback so that appropriate modifications can be made should be a high priority for the

researcher, particularly in the implementation of programs in natural community settings. Our use of formative evaluation has been described in a paper that draws on its use in field settings with smoking prevention and ST prevention research (Evans et al., 1989). Formative evaluation was used, for example, in the development of our measurement instrument for the longitudinal phase of the Little League program, to stringently revise the original instrument and its administrative procedures. The first field draft of the instrument was 45 pages long, 206 questions, and constructed at a third- to fourth-grade reading level. The initial reaction of subjects was so resistant we had to decrease its bulk, both through deleting some scales and reformatting so that the form looked less threatening. The revised instrument now has 145 questions, is 18 pages long, and is scaled down to a reading level of second to third grade to ensure comprehensibility for even less able readers. Measurement time originally averaged 30 to 45 min; the revised questionnaire now takes 20 min or less, well within the attention span of the average Little League player.

CONCLUSION We have addressed the potential for cross-application of well-evaluated smoking prevention programs to the newer issue of ST prevention programs, drawing on our own extended program of research in smoking prevention. We have discussed some of the barriers to successful development, implementation, and evaluation of such programs, including the problems related to tailoring interventions for special populations. We also reviewed some problems inherent in developing valid and reliable measurements in field-based studies, steps that might be taken to maintain a longitudinal study sample over time, and the value of formative evaluation throughout the course of a research program. A final issue of special concern to ST prevention researchers is that, to many young adolescents and their community leaders, tobacco—especially ST—does not fit within their concept of "drug" in the development of drug abuse prevention programs. We recommend that special emphasis be given to promoting the notion that tobacco is a drug, too. With respect to the relative emphasis on smoking in contrast to smokeless tobacco as a health threat, it seems more persuasive to no longer distinguish between smoking cigarettes and using ST. We recommend that a more generic phrase, "tobacco and health," be used.

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