

A Historical Perspective on Effective Prevention

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A history of effective drug abuse prevention research can be viewed as relatively short, but it also must be considered in terms of developmental stages in the evolving science of drug prevention. This chapter will focus on the earlier history of prevention science. Another chapter, by Botvin (this volume), will review the more recent research findings.

In an early review of research, NIDA Research Monograph 47, *Preventing Adolescent Drug Abuse: Intervention Strategies*, Leukefeld and Moskowitz (1983) stated that:

“... Research on prevention interventions is in its infancy due to theoretical and methodological inadequacies. Few interventions are theoretically based... Most evaluations have suffered from weak research designs...most studies evaluate program effects, few...evaluate program implementation. The result of these shortcomings is that there is little knowledge regarding how prevention programs actually operate; which programs have been effective; why certain programs have been effective; and whether these programs are likely to be effective in other settings or with other populations.” (p. 253)

This position was reiterated by Durell and Bukoski (1984) in reviewing 20 years of drug abuse prevention efforts including media campaigns, school drug education programs, and generic programs. They concluded, somewhat pessimistically, that:

“... Drug information curriculums in the schools have had little or no discernible effect on intentions to use drugs and actual drug-using behavior” (p. 26), and that “...both generic prevention programs and certain information programs have little or no effect in

producing desired changes in attitudes toward drugs and in actual drug use patterns.” (p. 27)

In a widely cited review of findings related to psychosocial approaches to smoking prevention, which have become one central approach to programs addressed to other harmful substances as well, Flay (1985) was more optimistic about the progress of such research:

“Four generations of research have been conducted within less than one half of a human generation (indeed, less than one decade). Given this, remarkable progress has been made in an important area of health psychology and public health... Research on smoking prevention...has evolved more systematically and progressed further than most other areas of health promotion.” (p. 482)

For more than four decades, it has been the privilege of this author to be an active participant-observer in the research processes described above, and this chapter will present a historical perspective from that frame of reference. Whereas a number of examples will be drawn from the smoking prevention research to which Flay refers, there is growing evidence, as suggested above, that the effective components of these smoking prevention programs may also be effective in addressing the prevention of use of alcohol and other drugs as described, for example, by Glynn and colleagues (1985).

In examining the history of prevention efforts, one first encounters the approach of conventional wisdom that high fear arousal is perceived as the major device for discouraging children and youth from engaging in self-destructive behaviors such as cigarette smoking and the use of alcohol and other drugs. As Janis and Feshbach (1953) originally suggested in their now classic study, high fear arousal does have some impact on short-term changes in behavior but not on truly long-term changes. For example, Marston (1970) reported that, immediately after a heart attack, individuals may change their behavior to avoid a recurrence but, over time, return to their original risk-taking lifestyle, which often includes smoking. So, even under conditions of intense fear, as Evans (1979) points out, permanent changes in health habits may not occur. Despite such evidence that high fear arousal by itself is not necessarily effective, it is still perceived in popular culture as a powerful deterrent to the use of harmful substances. As indicated below in excerpts from an editorial in *USA Today* (July 14, 1994), the editor seems to applaud the effectiveness of high fear messages in themselves, not considering the

probably critical role of other types of persuasive strategies to which the individuals might be exposed:

“Good News on Drugs. Just when hopes for success in the drug war looked darkest, a light has flickered on...independent researchers tracked 15,000 New York City grade-school children during 1992 and 1993. Among the findings: Urban children view drug dealers negatively and see drugs themselves as too scary to be tried. About 85 percent said they would walk away if offered drugs, up 7 percent from 1992. *The reason: Kids in inner cities witness the devastation of crack. Many have attended funerals of their friends. Dodged bullets. Seen dead bodies. And gone hungry because food money was spent on drugs. They want to avoid the grief of the older generation. Public service messages lend a powerful force, notably...ads targeting urban youth. You’ve seen them. They compare drug users’ brains to a frying egg and depict drug dealers as the losers and criminals they are. They work...* Kids are hearing and heeding the anti-drug message in the very areas where the tragedy of drugs is most vivid... This new evidence suggests a decade of effort is paying off.”

In an extensive review of the fear arousal literature, Higbee (1969) pointed out that no blanket statements could be made supporting the value of fear by itself as a motivator. Yet Higbee described various interventions that indicated how various levels of fear arousal might enhance the impact of other components of prevention programs. Such general conceptualizations concerning fear arousal were supported by Janis (1967), by Evans and colleagues (1970), and more recently by Sutton (1982). Several studies that have assessed the contributions of fear arousal, alone or combined with other factors, in preventing health-threatening behaviors will be used as examples in the discussion that follows.

As it became increasingly evident that fear arousal itself (that is, simply emphasizing the negative effects of engaging in a particular behavior) was not enough (Evans 1979), investigators sought to expand their prevention models. Janis and Feshbach (1953), in the study mentioned earlier, reported that the combination of a minimal fear approach with general toothbrushing instructions was more effective in increasing the incidence of toothbrushing among adolescent subjects than was a strong fear appeal alone. Subsequently,

Leventhal and colleagues (1965) challenged the relative importance of fear as a motivator to change a health-related behavior. In a study involving persuasion to submit to tetanus inoculations, they found that providing highly specific instructions on how to obtain such inoculations, without further fear arousal, was effective in motivating individuals to engage in the specific prevention behavior.

The University of Houston Research Group pursued the problem of the relative effectiveness of fear arousal in a series of basic studies in preventive dentistry¹ with young adolescents (Evans et al. 1970). Results of these studies indicated that exposing the student subjects on only one occasion to elaborated and modeled specific oral hygiene behaviors (without fear appeals or positive appeals) resulted in significantly more effective oral hygiene behavior. General oral hygiene instructions coupled with a positive appeal were almost as effective. Effective, but significantly less so, were fear appeals coupled with general oral hygiene instructions. Further, it was found that simple testing of subjects at irregular intervals, possibly perceived as monitoring, was almost as effective as the various persuasive messages. The effectiveness of monitoring itself was also demonstrated in a subsequent smoking prevention investigation by the Houston Group (Evans 1976). When the short-term study was extended over time, behavioral changes were maintained (Evans et al. 1975). To cross-validate self-reports of toothbrushing, a chemical indicator of cleanliness of teeth was employed (Evans et al. 1968). This cross-validation procedure was later effectively generalized to smoking prevention studies as the Houston Research Group developed the “pipeline procedure,” which included chemical analyses of saliva to increase the validity of self-reports (Evans et al. 1977).

Other traditional approaches to prevention that have been used extensively, but with only limited success, include the information model and the affective model described by Edmundson and colleagues (1991). The information model is based on the assumption that providing adolescents with factual information about a potentially destructive behavior, such as smoking or drug use, will prevent them from engaging in the behavior. Information may be presented in a variety of ways, such as didactic lectures by the classroom teacher, videotapes and films, posters and pamphlets, or guest speakers who are experts in the area. Despite evidence that this approach, which is essentially fear arousal, is largely ineffective (Goodstadt 1978; Thompson 1978), it remains the approach of choice of many school-based programs according to Murray and colleagues (Murray et al. 1988). Programs based on the affective model address more global attitude changes directed at such factors as enhanced self-esteem and

improved decisionmaking and goal setting, and often do not include specific information about self-destructive behaviors such as smoking or drug use (Durell and Bukoski 1984). Little evidence exists in support of this model for effective drug use prevention as well (Hansen et al. 1988; Tobler 1986).

The limited effectiveness of programs based primarily on fear arousal plus information led the Houston Research Group to consider a stronger conceptual foundation for prevention interventions. During the early 1970s, as a research group component of the National Heart Center at Baylor College of Medicine,² Evans and colleagues noted that children and young adolescents were aware of the dangers of smoking in terms of the long-term health consequences such as heart disease and cancer. As elementary school children, they often marshaled their knowledge of the dangers of smoking in an attempt to persuade their parents to quit smoking. At about the time they entered junior high school, however, many began to smoke. Fear induced by knowledge of the long-term dangers of smoking appeared to be insufficient to prevent its onset among many young adolescents when exposed to social pressures to engage in the behavior. It was decided to attack the problem through an intervention program designed to influence students to refrain from smoking as they entered and moved through junior high school (Evans 1976).

Given the prevailing belief of the effectiveness of fear arousal described previously, it was not surprising that a survey of junior high school smoking prevention programs at this time revealed that most programs focused too intensely on fear-arousing messages. As suggested earlier, they emphasized the long-term effects of smoking such as heart disease or cancer without recognizing the present-oriented rather than future-oriented time perspective of young adolescents (Mittelmark 1978). The programs rarely reflected feedback from target groups in their designs and seemed to ignore previous research on effective use of media. A critical deficit in most of these early programs was the lack of any form of systematic evaluation. The Houston Research Group conducted a series of focused interviews drawing from a large population of seventh grade students (Evans et al. 1984). Subject responses suggested that various levels of peer pressure, models of smoking parents, and smoking-related messages in the mass media that featured attractive smokers were influences that might encourage them to initiate smoking. Such influences seemed to outweigh concerns about the dangers of smoking. A pilot study was conducted that supplemented fear arousal messages with information concerning the social pressures impacting young adolescents to begin smoking, together with training in specific skills

to resist these pressures (Evans et al. 1978). Based on the results of this pilot study, a prevention program that incorporated these social influences was developed and evaluated. This social inoculation model, as it was described, appears to have guided much of the prevention research for the past two decades. Referring to the work of the Houston Group (Evans 1976, 1983, 1984; Evans and Raines 1982; Evans et al. 1981, 1984), Edmundson and colleagues (1991) stated:

“The social influences model recognizes smoking in adolescents as primarily a social behavior. This model includes the following four components: (1) information on the negative social effects and short-term physiological consequences of tobacco use; (2) information on the social influences that encourage smoking among adolescents, particularly peer, parent, and mass media influences; (3) correction of inflated normative expectations of the prevalence of adolescent smoking; and (4) training, modeling, rehearsing, and reinforcing of methods to resist those influences and to communicate that resistance to others, particularly peers.” (p. 154)

The evolution of such social influences models has drawn on various concepts in psychology. Bandura’s social learning theory (1977) was particularly relevant in the early formulations of the social inoculation model. As applied to the initiation of smoking, the theory suggested that children might acquire expectations and learned behaviors vis-a-vis smoking through observation. They might learn vicariously that smoking appears to relieve tension or anxiety. Vicariously learned expectations of the positive and negative consequences of cigarette smoking could be important factors in the ultimate decision regarding smoking behavior. Bandura’s (1982, 1989) more recent development of the concept of self-efficacy that further explicates this notion has become central to some current models of smoking and drug use cessation, such as the stage theories developed by DiClemente and colleagues (1991). This social inoculation model, which also incorporated effective skills to resist social influences to smoke by “inoculating” adolescents with knowledge and social skills for resisting such pressures, might be perceived as a behavioral variation of McGuire’s (1961) cognitive inoculation model. McGuire’s (1968) communication-persuasion model, essentially an information-processing analysis, proved to be useful as a guide to the sequence of messages within prevention programs targeted for the young adolescent audience.

To more fully describe the content of the social inoculation model, it should be mentioned that it included both social-environmental and personality or intrapersonal determinants that contribute to the complex of influences that encourage the use of harmful substances. Implicit in the model was the conception that as children reach early adolescence, they experience greatly increased vulnerability, greater mobility, and greater freedom from adult authority figures. Experimentation with personal identity and lifestyle choices, which marks this period of development, could include use of tobacco or other harmful substances, and conflicting expectations could override both personal beliefs and parental or family values. This model identified smoking, or use of alcohol and other drugs, both as a form of rebellion against authority, including risk taking, and as part of a new and different lifestyle for adolescents during the early teenage years. For example, it might predict the initiation of smoking for children as young as 10 or 11. In fact, it might be noted here that in the early 1970s, as the original social inoculation studies (which addressed smoking) were being planned, smoking initiation reflected an upward trend from the elementary grades to high school (Johnston et al. 1979; Thompson 1978), with a significant enough shift at about the seventh grade level that the Houston Group chose to begin its prevention intervention at seventh grade. Even preliminary results from the current NIDA-supported Minority Adolescent Drug Use Prevention project (for which the author serves as principal investigator)³ indicate that 31.8 percent of the subjects had initiated cigarette smoking at or before the age of 11 and prior to entry into sixth grade. Similar patterns of initiation appear to be operative in the use of alcohol and illegal drugs.

Variations of the social influences-based models that have been involved in the formation of prevention programs have appeared to be quite effective, at least initially, in preventing substance use, as reported by a number of investigators including Best and colleagues (1984), Biglan and colleagues (1987*a, b*), Elikson and colleagues (1993), Flay and colleagues (1983, 1987), McAlister and colleagues (1979, 1980), Pentz and colleagues (1989), and Perry and colleagues (1989). The cognitive-behavioral model, which expands the social influences model with additional problemsolving, decisionmaking, and self-control methods, has also been the basis for prevention programs that have produced positive results as reported by Kendall and Hollon (1979), Gilchrest and colleagues (1979), Schinke and Blythe (1981), and Schinke and Gilchrest (1983). The life skills model developed by Botvin and colleagues (1980, 1982) incorporates components of the social influences model and the cognitive-behavioral model, with a

particularly strong emphasis on training adolescents to cope with social challenges. This program also appears to have produced promising results.

Additional conceptual areas in psychology have been utilized in programs designed to prevent the use of harmful substances. Included here would be Festinger's (1957) theory of cognitive dissonance used in explorations of conflict between health beliefs and the initiation of health-threatening behaviors such as smoking and the Jessor and Jessor (1977) multi-determinant conceptual structure of problem behavior, which has been successful in predicting age-graded problem behaviors that are considered acceptable in adults but not in adolescents. The latter model has been incorporated into several longitudinal research designs, for example, the work of Sherman and colleagues (1979, 1982). These investigators attempted to explain the onset of smoking and the transition in status from nonsmoker to smoker. Ajzen and Fishbein proposed a framework for predicting behavioral intentions, which were assumed to mediate and thus predict subsequent overt behavior (Ajzen and Fishbein 1970; Fishbein and Ajzen 1975). This model, which has been applied with some success in studies of alcohol use in adolescents (Schlegel et al. 1977), also appears to lend itself to empirically testable hypotheses that could tease out important components of the development of smoking behavior. For example, within the Houston Group's research program, Henderson's (1979) small-scale study of smoking in a population of older adolescents, based on this model, provided a provocative basis from which more elaborate investigations could employ structural equation or causal models (e.g., Dill 1981). Subsequent investigators also developed interventions directed toward altering some of the situational and intrapersonal determinants of smoking (Botvin et al. 1980; Hurd et al. 1980). Other investigators began focusing on mediators of the initiation of substance use, such as modifying perceptions of social norms and directly addressing moderators such as peer pressure (e.g., Sussman 1989).

More recently, as researchers began working within the framework of structural equation modeling and path analyses, they also began to address the question of synergism; that is, to what degree does the initiation of use of one harmful substance trigger the initiation of use of another substance? A syndrome of problem behavior may be present that includes the use of tobacco, alcohol, and illegal drugs together with other risk-taking behaviors (Elders et al. 1994). It appears that adolescents often engage in more than one risk behavior during this stage of their lives. Even though the specific risk behaviors may differ, the common thread for all adolescents may be

exposure to such risk factors. Researchers in prevention began to recognize that all prevention programs, however different (e.g., avoiding tobacco, illegal drugs, and alcohol; preventing pregnancy and sexually transmitted diseases (STDs); prevention of violence), may be influenced by the same set of factors that make adolescents susceptible to choosing high-risk behaviors. Another operant consideration in prevention programs became apparent when Vega and colleagues (1993) suggested that distribution of risk factors is similar among ethnic groups even if the susceptibility to those risk factors may differ. Also in this area of interconnectedness of risk behaviors is the possibility that risk taking may begin with one risk behavior such as cigarette smoking and progress to other more risky behaviors as the student gets older. Kandel and Yamaguchi (1993) have suggested that cigarette smoking itself is a risk factor for illegal drug use and that there is a predictable pattern of engaging in harder and harder drugs. Such hypothesized synergism among the use of various drugs must be considered in prevention programs (Stall et al. 1986). Aside from investigating synergisms, longitudinal designs employing confirmatory factor analysis, and structural equation modeling that NIDA-funded investigators are employing in current investigations, should help to identify multiple indicator latent variables and possible causal relationships among the use of various substances and other health-risk behaviors.

For example, at least three theoretical possibilities for drug progression exist within various ethnic groups: (1) nonsynergism, that is, there is no tendency for persons engaging in particular risk behaviors to be engaging in other such behaviors; (2) simple synergism, which describes persons engaging in particular risk behaviors tending to engage in other risk behaviors without a specific causal sequence in the initiation of such behaviors; and (3) gateway synergism, as demonstrated in the Kandel and Yamaguchi (1993) study referred to previously, in which persons engaging in particular risk behaviors tend to engage in other risks, with certain risk behaviors leading causally to the initiation of others. While risk-behavior synergism has been reported by some investigators who utilized cross-sectional data (Biglan et al. 1990; Hingston et al. 1990), the lack of data obtained from sound prospective investigations precludes distinguishing between simple and gateway synergism. Therefore, a general guideline is not clearly developed concerning whether interventions should focus on the prevention of the use of one harmful substance or should address various harmful substances simultaneously.

The issue of acquired immunodeficiency syndrome (AIDS) prevention must now be seriously considered within this context of synergism among such risky behaviors. Because of the current concern about risky sexual behavior, including exposure to human immunodeficiency virus (HIV) among adolescents, a drug use prevention investigation could hardly be undertaken without recognizing the relation between drug use and sexual behavior. Teenage sexual activity within the context of drug use may well result in impairment of responsible decisionmaking that would otherwise lead to the practice of “safer sex” (Adler et al. 1990).

According to Evans and associates (1991), the relationship between HIV risk, drug use, and sexual behavior is a complex, reciprocally reinforcing, biopsychosocial phenomenon. Despite their increasing knowledge of the dangers of drug use, and unprotected sexual behaviors, as would be predicted from the limitations of the effectiveness of high fear arousal messages in themselves and as would be expected based on earlier studies of the use of harmful substances, many young adolescents still initiate such behaviors (Miller et al. 1990; Morrison 1985). When theory is marshaled to explain such phenomena, possible interpretations might be gleaned from some variant of rational choice theory or subjective expected utility theory (Gilbert et al. 1986; Luker 1975; Weisman et al. 1991). These theories could also be utilized to examine the decisionmaking process involving cost-benefit analyses of alternative behaviors. Another investigation dealing with AIDS prevention currently being conducted by the Houston Research Group employs a planned behavior/action control perspective, which pays close attention to the role of social influence in the use of harmful substances as related to risky sexual behavior. Consistent with the discussion of sexual behavior presented by Weisman and colleagues (1991), it can be inferred that the initiation of drug use is best regarded as relationally determined; i.e., not only does it require the presence of another person (at least for it to constitute an HIV risk), but the actions of that other person occur within a social context having impact upon the quality of one’s decisionmaking processes vis-a-vis drug use.

While suggesting that teenage sexual behavior can be interpreted as rational (Loewenstein and Furstenberg 1991), it can be argued that sexual activity in the context of drug use can result in the derailing of a decision process that might otherwise lead to the practice of safer sex as described by Adler and others (1990). Dryfoos (1990) estimates that 25 percent of the adolescent population is using alcohol or marijuana heavily and is engaging in unprotected sexual intercourse. If this estimate is correct, it might be inferred that this

same proportion is at high risk for contracting HIV. Dryfoos' (1990) estimation that underprivileged black and Hispanic adolescents, particularly those who are falling short academically, are overrepresented in this high-risk group is consistent with epidemiological data linking drug use, early sexual activity, race/ethnicity, and AIDS prevalence (Miller et al. 1990; Strassberg and Mahoney 1988).

A review by Kirby (1994) that assessed curriculums used for preventing sexual risk behavior suggests that successful programs might be based on social learning or social influence models such as social inoculation. These programs focus on reducing specific risk-taking behaviors, are interactive, provide training for teachers who are taught about social influences such as the media, and, finally, focus on specific behavioral values and norms. Interestingly, findings concerning sexual risk behavior are relevant to drug prevention programs and other risk-taking interventions as well.

Another significant problem that should be addressed is the at-risk status of minority youth (Carvajal et al., in press). For example, in the current NIDA-supported study previously described,³ differences among minority groups in incidence of use of various substances represent critical issues that must be addressed. Prevention programs must be sensitive to the distinctions that are present when minority populations are targeted. For example, preliminary research suggests a correlation between the use of certain substances and ethnic affiliation. As shown in tables 1 and 2, data from this study indicate some significant differences in use among three ethnic groups. It can be seen, for example, that African-American adolescents as a group tend to report less smoking than whites and Hispanics. Some Hispanic populations report a much greater use of inhalants than other groups. As a result, prevention/intervention programs need to be sensitive to these possible distinctions to ensure that the most effective indigenous message is presented to each group.

TABLE 1. *Percentage reporting use of various drugs x ethnicity among middle school students in grades 6 through 8 (N = 2,446).*

	Whites (44%)	African Americans (36%)	Mexican (20%)
Americans			
Alcohol	61	42	54
Beer	58	50	60
Cigarettes	48	32*	54
Cocaine	3	3	5
Downers	4	2	3
Hallucinogens	7	2*	6
Inhalants	17	7*	20
IV drugs	2	2	2
Marijuana	12	18	21
Smokeless tobacco	21	6*	12
Speed	5	3	7
Steroids	4	2	1
Ecstasy	2	1	2

KEY: * = Significantly less reported use than other ethnic groups

SOURCE: Evans, in press.

TABLE 2. *Percentage reporting use of various drugs x ethnicity among high school students in grades 9 through 12 (N = 2,190).*

	Whites Americans (49%)	African Americans (34%)	Mexican (17%)
Alcohol	84	70	78
Beer	80	69	75
Cigarettes	66	40*	65
Cocaine	6	2	10
Downers	6	2	5
Hallucinogens	15	2*	15
Inhalants	15	4*	18
IV drugs	2	1	1
Marijuana	30	27	40
Smokeless tobacco	34	5*	20
Speed	13	1*	8
Steroids	3	1	2
Ecstasy	6	1	5

KEY: * = Significantly less reported use than other ethnic groups

SOURCE: Evans, in press.

Although use of substances and the prevention of such use among members of the majority population have been widely studied (Bell and Battjes 1985; Glynn et al. 1985), few large-scale studies target

minority populations. Among these are investigations conducted by Botvin (1986), Evans (1989, 1994), Schinke and colleagues (1988), and Orlandi (1986). Minority and low socioeconomic status generally are considered important risk factors for drug abuse although the relationships are complex (Dryfoos 1990; Pentz et al. 1990).

Another issue confronting prevention researchers is that high-dosage/high-frequency prevention programs and their benefits, in terms of cost effectiveness, must be considered because the effects of short-term interventions often wash out (Murray et al. 1989). Johnston and colleagues (1996) indicate that there is a marked increase in the rate of cigarette smoking and use of other substances among high school seniors. These data reinforce the consequences of the washout of long-term effects of middle school or early high school intervention programs that are not adequately reinforced. Ellikson and colleagues (1993) point out, however, that even with equivocation concerning long-term effectiveness of prevention programs, any successful delay of engaging in high-risk behavior results in a lowered risk of contracting an STD, being in a car wreck, or other consequences that can result in poorer health and higher treatment costs. The longer that onset is delayed, the more success will be gained in avoiding illness and psychosocial effects attached to high-risk behavior. If initiation can be delayed long enough, will the adolescent high-risk avoidance behavior carry over into adult decisionmaking about health choices? If success is to be achieved in changing social norms, these same messages must be communicated within the community as well as in the school or social setting where adolescents may initially be exposed to the messages. Considerable evidence of the value of this approach is apparent as more and more institutions and communities commit to limiting exposure of nonsmokers to cigarette smoke.

Finally, although economic terms such as “cost-effectiveness” and “cost-benefit analysis” are used in politics and administration and to define outcomes in evaluation, there is surprisingly little cost-benefit analysis in research in the prevention area. Even in sustained prevention programs such as Project Head Start, cost-benefit data appear to be equivocal or limited in scope (Cicirelli 1969). One major reason for the dearth of such analyses seems to be that too few prevention program administrators and evaluators utilize the various disciplines that can contribute to such analyses. As Levin (1983) points out, “Policy decisions in the public sector must be based increasingly upon a demonstrated consideration of both the costs and the effects of such decisions.” (p. 11). Future prevention research

needs to focus on the cost-benefit and cost-effectiveness of drug prevention programs.

NOTES

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