Drug abuse prevention programs may be delivered as universal (designed to affect the general population), selective (designed to affect certain groups of people who are at a higher risk for developing a problem, based on social, psychological, or other factors), or indicated (designed to affect high-risk groups of people who have already been identified as demonstrating noticeable signs or symptoms of developing a problem). Not all high school students use drugs, and most students who use drugs do not abuse them in adulthood. Perhaps prevention programs should focus on youth who are at the highest risk for drug abuse (selective or indicated). It may be more cost-effective to target youth who are most likely to abuse drugs in the future than to target much larger numbers of youth, many of whom will not abuse drugs. It is not surprising that one of the most difficult but important tasks in the minds of many drug abuse prevention practitioners is to intervene with youth at highest risk for future drug abuse. The task of indicated prevention was the primary goal of Project Towards No Drug Abuse.

This chapter describes some of the program development work and results of a nine-year ongoing prevention project (Project Towards No Drug Abuse), addressing primarily continuation high school youth. Continuation high school youth are those adolescents who have been identified as having behavioral problems or difficulty functioning in the normal school environment. Usually, these students attend a special school comprised of other students with similar problems or situations. These youth are at high risk for drug abuse. The curriculum development process directed us toward the potential benefit of a motivation-skills-decision making curriculum. Comprehensive social influences programming, generally used with younger and lower-risk youth, is not likely to be effective among high-risk youth. Such programming can be poorly received and does not reflect well the issues faced by this population.

In Project Towards No Drug Abuse-1 (1992-1997), this motivation-skills-decision making program was evaluated in twenty-one schools. Each school was assigned to one of three experimental conditions: standard care (control), health educator led classroom program, and classroom program plus a community component. Students completed a pretest questionnaire prior to the implementation of the program. One year later, they completed a posttest to measure changes in their use of cigarettes, alcohol, marijuana, and hard drugs. Approximately 67% of students completed both the pretest and posttest surveys (i.e., 1,029 students in all). After one year, it was evident that students in both of the program conditions experienced changes in their alcohol and hard drug use, but not on the other drugs (Sussman, Dent, Stacy, & Craig, 1998). After two years, these effects were still evident for females, and effects on hard drug use only were maintained after three years for females.

Data continue to be collected. It is encouraging that this nine-lesson program can exert any behavioral effects among high-risk youth over a three-year period. Within a comprehensive high school setting, nearly identical results at a one-year follow-up were found. Thus, it is clear that such programming can reach high-risk youth in general as well as specific population contexts.
Project Towards No Drug Abuse-2 (1997-2001) involves a test of two methods for teaching the programming. One is health educator led and the other is health educator assisted programming. Also, in an effort to produce positive changes on marijuana use and cigarette smoking, the number of lessons for the program has been extended from 9 to 12. In addition, we include the use of novel memory booster programming. This study currently is in the posttest data collection phase. Immediate effects on behavioral intentions and knowledge suggest as strong an impact on cigarette and marijuana smoking as on alcohol and hard drug use.

Project Towards No Drug Abuse is the first program to demonstrate longer-term effects on alcohol use and hard drug use among older, high-risk youth by using a school-based, limited-lesson model (nine lessons). Motivations for health, social skills, and decision making program components elicit some drug use preventive effects among high-risk youth.

**High-Risk Youth**

As a point of clarification, the applicability of prevention programming to higher risk populations is contingent on how "high-risk" is defined. This term could refer to a disadvantaged socioeconomic group, risk-takers, youth with problems at school, and targets of some drug promotions (e.g., of cigarettes and alcohol), among others. The target group of some drug use prevention researchers has been disadvantaged 12-year olds (e.g., Leshner, 1996; Smith et al., 1995; St Pierre, Kaltreider, Mark, & Aikin, 1992). Commitment to education, attachment to teachers, strong parent-child attachment, and having peer friends with conventional norms, are important protective factors within young, disadvantaged populations. Family involvement, teacher empathy training, and effective communication/bonding skills are useful preventive strategies. Other researchers have investigated potential dropouts among a regular high school population (e.g., Eggert, 1996; Eggert et al., 1994). Finding means to reduce school strain, family strain, or deviant peer bonding, through use of a caring staff advisor, small student group discussions and life skills training have been attempted (Eggert, 1996). For youth who are targets of media promotions, such as young adolescents relatively high in risk-taking preferences, instruction in awareness of media informational social influences is an important remedy (Sussman et al., 1995a).

Another widely shared perspective of risk is defined as "the percentage of users within a social environment" (Johnson et al., 1990). The greater the percentage of drug users within a large (e.g., school, community) or small (e.g., peer group) social environment, the more at risk are its group members to continue to use and eventually abuse substances. In applying this definition to schools, we could argue that differences in the percentage of users at different schools would reflect different levels of risk. This perspective differs from other ones that tend to focus on indirect measures of risk for drug abuse such as socioeconomic status or ethnicity. The present definition focuses on a direct environmental definition. The main goal of our parent project, "Project Towards No Drug Abuse (Project Towards No Drug Abuse)," was to provide classroom-based programming to youth at continuation high schools, the alternative school system in California. Continuation high schools were created to fulfill a California mandate that all youth receive part-time education until they are 18 years of age (California Educational Code Section 48400; established in 1919). Continuation versus comprehensive high schools form a natural demarcation of youth who are at relatively high or low risk for substance use. Before entering high school in California, youth remain at the same elementary or junior high school. When reaching high school age, those youth who are unable to remain in the regular/comprehensive school system for functional reasons, including substance use, are transferred to a continuation high school. While the parents of
these youths may be somewhat lower in socioeconomic status than their comprehensive high school peers (Sussman et al., 1995b), these youth are not impoverished.

Drugs are used at a much higher level at continuation rather than regular high schools. Use in the last month of the following substances is as follows, as measured at pretest in 1994-1995 (n=2002): cigarettes, 56.5%; alcohol, 64.3%; marijuana, 54.8%; cocaine, 7.5%; hallucinogens, 12.7%; stimulants, 21.1%; inhalants, 6%; and other drugs (e.g., heroin, depressants, PCP), 5%. For comparison, in comprehensive high schools, use in the last month of the following substances is as follows (n=1208): cigarettes, 24%; alcohol, 36%; marijuana, 22%; cocaine, 1%; hallucinogens, 2%; stimulants, 2%; inhalants, 3%; and other drugs, 1%. Continuation high schools as such do not cause youth to continue to use drugs. To the contrary, these specialized schools may provide the additional personal attention needed to help youth correct deficiencies in life skills (e.g., 15:1 teacher-student ratios), increase bonding with social institutions, and otherwise help them to overcome several risks for drug abuse (i.e., build resiliency). However, continuation high school students also are exposed on a daily basis to numerous other students who use drugs, and attitudes favorable to drug use are likely to be shaped and supported by other youths in such an environment. These youth also are relatively likely to suffer consequences of substance abuse as young adults.

**Will Comprehensive Social Influences Programs Work With High-risk Youth?**

Drug abuse prevention researchers have not come to an agreement regarding whether the effectiveness of social influence prevention programs may differ based on the level of risk of the target group. Some researchers have not found that the effects of school-based (Hansen et al. 1988) or community programs (Johnson et al. 1990) vary as a function of the level of risk of the participants. In some instances, they even favor those who are more disadvantaged. (Graham et al. 1990). On the other hand, other researchers have suggested or provided evidence that prevention programming could result in reactance effects (regarding cigarette smoking, as a function of behavioral risk but not socioeconomic risk; Ellickson & Bell 1990), or that prevention programming would be less likely to affect those at highest risk for substance abuse as opposed to use (e.g., Tobler 1986; Newcomb & Bentler 1989).

Social influence programs that target the general population of students could be effective among high-risk youth but only if certain social influence processes still operate and serve as the main cause for use (Sussman et al. 1995b). However, life difficulties, interference in the school context, and academic limitations may make it especially difficult to engage high-risk youth in any programming. For instance, many social influence programs focus on teaching students about the physical consequences of using substances. This tactic may have relatively little effect on behavior because for high-risk youth popular social images associated with use have more of an impact on their perceptions of whether drug use is normal and accepted. Also, high-risk youth are less likely to publicly state a commitment to not use drugs, another common strategy in social influence programs, which would hinder the impact of the program for everyone in the class.

Another typical approach in social influence programs is to teach normative education lessons. These lessons focus on helping students to understand that deviant behavior is not really normal among their peers. Most students tend to overestimate the number of people at their school who are actually using drugs. This overestimation can lead youth to believe that drug use is normal. Therefore, correcting this misperception can be an effective way to reduce drug use. However, with high-risk youth, deviant behavior may in fact be normal. That is, there may be many drug users in their peer group. Moreover, few high-risk youth would openly state their disapproval of drug use. When misperceptions do arise, youth in a high-risk
environment may be less likely to provide corrective social information. Ultimately, they may feel less hopeful than others that they can act to change their social environment. Thus, the normative education approach would probably exert a weak impact.

Other social influence programs rely on teaching students refusal skills. This approach assumes that one refuses offers because one does not want to use drugs. High-risk youth may not be interested in learning refusal assertion skills because they have already started using drugs and do not have the desire to resist drug offers. It is clear from the limitations outlined above that using standard social influence strategies with high-risk youth may not be effective. More research is needed with higher risk populations to better assess the potential applicability of social influences prevention programming.

One point seems clear to many program planners: Continuation high school youth, as with other high-risk youth, cope differently with their problems than do youth who are not higher risk. To avoid engaging in high-risk behavior they need reasons to change and goals to strive for that fit within their own belief systems. In addition, perceived obstacles to reaching those goals should be acknowledged and means to surmount those obstacles should be suggested. Project Towards No Drug Abuse involves using a program development process in which consumer demand is a primary criterion of lesson selection. Consumer demand considers the motivations and preferences of the consumer. By considering the specific motivations of continuation high school youth, perhaps optimal programming may be developed.

**Empirical Program Development**

It is important for researchers in health education to develop prevention programs that can be carefully evaluated. Often, program evaluations are done only after the whole curriculum is developed. A program will be more effective if changes or modifications are based on solid research rather than on the intuition of those involved in implementing and teaching the program. By not evaluating a curriculum as it is developed, health education researchers and health educators (curricula writers) run the risk of allowing potential biases to interfere with objectivity. To strengthen the quality of research and the usefulness of a multi-lesson prevention curriculum, an iterative development and evaluation approach is recommended.

Four general steps of curriculum development have been suggested in school-based prevention research (Sussman, Petosa, & Clarke, 1996). The first step involves adopting and extending a theoretical knowledge base. This includes using a strong theory to guide the development of the program as well as doing assessments of the curriculum to see how well the components of the program relate to the theory. If a theory predicts that certain things should occur and those things do not occur, then modifications need to be made to the program or theory. The second step is one of pooling curriculum activities from various sources or creating activities which might counteract problems identified in the first step. The third step involves testing of individual lessons collected together in the earlier step. This can be done by assessing educators’ perceptions of how capable they thought the program was of producing positive changes in students. The fourth and final step involves testing a full curriculum, which involves combining lessons, and assessing the workability and immediate impact of the full curriculum.

Project Towards No Drug Abuse made use of many research arenas in the development of its prevention programming. These research arenas included theories from learning theory and behavioral-therapy, social psychology, sociology, chemical dependency treatment, and motivation. Important concepts related to students’ bonding to positive people and groups,
the effects of stereotyping, family roles, stress coping, and others were included in our approach.

Based on these research perspectives, various program development studies were conducted (see Sussman, 1996 for a summary of that work). Some of this program development work indicated that, among comprehensive social influence-type lessons that focus on teaching listening skills, decision making skills, and information related to the physical consequences of using substances, relatively strong knowledge or belief changes are found. Lessons that focus on teaching refusal assertion skills and practice lessons are rated as relatively very weak (Sussman et al., 1995b). Other work, which compared social influence-type lessons with other, novel lessons, indicated a clear preference for novel versus traditional social influence activities. In particular, a "talk show" discussion of the effects of drug use addiction and drug use and driving, and three motivational-type activities (attitudinal perspective taking, stereotyping, and health as a value) are preferred. Of the social influence-type activities, decision making and effective communication lessons are preferred (Dent et al., 1996).

The lessons were designed around activities that were consistent with a motivation-skills-decision making perspective of indicated prevention. The curriculum delivery system consisted of three lessons per week. The first three lessons help the students become open-minded to receiving further material (listening, stereotyping, myths and denial). The next three lessons teach students about chemical dependency issues and coping strategies (chemical dependency, talk show, stress-coping). The last three lessons motivate students to consider other means for coping (self-control, perspectives, decision-making and commitment; Sussman, 1996). In addition, a school-as-community component was developed through a similar process (Sussman et al., 1997).

Program Evaluation

The nine-lesson Project Towards No Drug Abuse curriculum, which utilizes a motivation-skills-decision making model of drug abuse prevention, was successfully implemented at 14 schools (Dent et al., 1998). Nine project health educators were arbitrarily assigned to schools based on availability and demand. They participated in an extensive 3-week training. The program was delivered throughout the school year. A total of 102 - 9 lesson classes were conducted. Those students who were absent on days that a lesson was implemented were provided with single-page summaries of the material from each lesson which they could utilize as a means to "make-up" learning of missed lesson material. Implementation was successful and process evaluations were positive.

School-as-community Component

This component was completed at 7 schools, which included the implementation of weekly ASB-Towards No Drug Abuse meetings for six months, implementation of six events per school, and distribution of a Continuation Community Newsletter across these 7 schools (Sussman et al., 1997). Events completed include job training, sports participation, self-defense training, drug-free parties, drug awareness weeks, canned food and clothes drives, drug prevention instruction for elementary youth, drunk driving/drug-related movie activity, prevention of unsafe sex and drug use, law enforcement and Alcoholics Anonymous speakers, and contribution to the newsletter. Banners were provided ("Check it out. Drug-free event") to help schools maintain inclusion of a drug use prevention-related focus at each event.
Evaluation

A total of 22 school districts from a five county region of southern California were recruited for participation in the study. Each district contained one continuation high school. The smallest sized school was dropped. Thus, a total of 21 of schools were assigned to one of three experimental conditions - standard care (control), classroom program, and classroom program plus school-as-community. An immediate pretest (baseline assessment) was followed by a three week long drug abuse prevention program at 14 continuation high schools (7 schools received a semester-long school-as-community component as well as a classroom program whereas 7 did not), and 7 other schools received only the pretest (standard care). Posttest collection at all schools was conducted one-month following the pretest.

Pretest or posttest data were collected from approximately 70% of the students. Approximately 3% of the youth or their parents refused to continue participation. Another 6% of the students were not available for interviews. Interviewers had either reached their family or them at least once, but the student was not available then or was not at home after repeated phone calls (an average of 7 attempts). A follow-up survey was provided to 67% of this targeted sample.

One-year follow-up data were analyzed. Those who received the intervention showed nearly half the monthly hard drug use frequency at follow-up compared to those in the control group.

There were significant findings for alcohol and hard drug use. For alcohol, there appeared to be no effect of the program among people who had not used alcohol at the time of the pretest or who had reported lower levels of use. For those who reported higher levels of alcohol use at the time of the pretest, the students who were in the classroom-only condition did exhibit lower alcohol use at one-year follow-up compared to the students in the control condition. (approximately a 25% relative reduction in use). The difference between the two program conditions among students with higher levels of alcohol use at pretest was not significant.

For hard drug use, all subjects across levels of baseline hard drug use seemed to benefit from being exposed to the program. The difference between the two program conditions was not significant. Approximately a 65% relative reduction in use was achieved when the two program conditions were compared to the standard core condition.

The intervention program had an impact on high-risk youth, although the school-as-community component apparently did not enhance this effect, with the possible exception of alcohol use reduction. The booster at the one-year follow-up was 20-minutes long. It followed the posttest assessment. In general, youth were asked how they used this material in the last year and how they might use it in the next year. Also, a Continuation Community Newsletter continued to be implemented at the 7 combined-component schools, and was sent out to all those who had attended the Towards No Drug Abuse combined program the previous year. After two years, the effects of the program held up for females. After three years the effects of the program on hard drug use were still evident for females only. The trend of the data at the three-year follow-up is for classroom-only program to work relatively well for those students who had reported higher levels of use at prior to participating in the program, whereas the school-as-community/combined program worked relatively well for those who had reported low levels of use at prior to participating in the program. Both programs found better results than control condition at all levels of use reported prior to the program (see Sussman, Dent, Stacy, & Craig, 1998).
Generalizability Trial

To test how well the results of the previous study could be generalized to students in other schools, a follow-up study was conducted. This group of students was quite diverse. The sample consisted of 42% male, 36% White, 38% Latino, and 26% African American. The results were the same as for the continuation high school youth. Effects were found for those students with higher levels of alcohol use at pretest. There was a 60% relative reduction for alcohol and a 60-75% relative reduction for hard drug use across all levels of use at a one-year follow-up.

Project Towards No Drug Abuse Follow-up Grant

Only a few studies have been effective at preventing drug use among relatively high-risk youth. Most of these studies have employed weak statistical methods; generally have not included a detailed evaluation component; involve either delivery of daily lessons (i.e., well over 60 lessons) over a semester, or intensive programming such as two-week camp out-type survival training or community-wide programming; and generally focus on middle school youth. Project Towards No Drug Abuse is the first carefully evaluated program to demonstrate one-year self-reported behavioral effects on alcohol use and hard drug use among a large sample of older, high-risk youth by using a school-based, limited-lesson delivery model. However, the program did not achieve one-year behavioral effects on use of cigarettes and marijuana. The present study expanded the prevention curriculum from nine to 12 lessons to try to affect a greater variety of types of drug use, and tested the expanded curriculum in a new continuation high school group.

Based on some of our initial work (Sussman, 1996), we know that 12 lessons apparently is a maximum number that continuation high school personnel will permit at their schools. Since this curriculum needs to be generalizable to the "real-world" setting, as well as be maximally effective, only three new lessons were added. One lesson focused on marijuana use. A description was provided of the subtleties of marijuana use consequences (e.g., emotional growth is stunted because emotional outcomes and processes may become confused). The lessons taught how subtle immediate negative consequences often are ignored, are attributed to a source different than drug use per se, or are reinterpreted as positive consequences. A panel on marijuana use was created and class discussion related to marijuana use was conducted.

A second lesson focused on cigarette smoking cessation. The lesson included information about the illusion of getting used to smoking when you are really becoming addicted, immediate cardiovascular and lung consequences, how cigarette use is not seen as “cool” when you become an adult, and ways to quit smoking (including use of a self-help booklet).

The final lesson expanded on the self-control lesson in Project Towards No Drug Abuse. In that earlier lesson, the dimension of self-control that was discussed primarily attempted to help students modify their provocative behavior, or to learn how to appropriately behave in certain situations. The current lesson focuses on anger coping, which is highly correlated with drug use and violence. The ways in which drug use and violence interact were discussed, and self-control of aggression was instructed.

A program is "effective" only if it is delivered in such a way that is acceptable and available to the target audience. Thus, in addition to lengthening the program, two modes of delivery were compared in the present study: an efficacy condition (health educator-led classroom program) and a treatment effectiveness condition (health educator-assisted self-instruction program that most resembled what was generally used at continuation high
schools). The self-instruction curriculum consists of self-reviews with answer keys. All program material is re-written, very similar to the health educator-delivered program but with a programmed learning style of presentation, and several icons are used to enhance the readability of the material. Once a program has demonstrated treatment effectiveness, it would be tested for implementation effectiveness (i.e., under real-world conditions of delivery like classroom teacher-assisted self-instruction at continuation high schools).

The health educator-delivered classroom program was compared to a health educator-assisted self-instruction program (the type usually delivered in continuation high schools). Both of these programs were compared to a standard care (control) condition. Eighteen schools participated. Booster programming was included once the program was completed to enhance participants’ memory of the program. After one and two year follow-ups, students are being tested to see how much the program affected them. In comparing the two programs, we were primarily concerned with whether one program was better at producing preventive effects that the other. We suspect that efficacy condition will achieve greater effects than the treatment effectiveness condition because students will have more interaction with other students in the classroom (e.g., student group interaction has been conjectured to be an important characteristic of effective substance abuse prevention programming; Ennett, Tobler, Ringwalt, & Flewelling, 1994). However, it is just as likely that the treatment effectiveness condition could achieve a greater preventive effect because it is better tailored to the continuation high school context. The answers to these questions are important for drug abuse prevention research. At an immediate posttest, there have been small to moderate effects on behavioral intentions of students to use all four categories of drug use in the future, and moderate effects on students’ knowledge, particularly on stereotyping, the new marijuana panel lesson, perspectives, the talk show, self-control, and the new tobacco cessation lesson.

**The Importance of Booster Programming**

Previous research shows that school-based drug use prevention programs implemented in junior high school have little chance of long-term success, especially for those youth who began using drugs before the prevention program was implemented, unless such programs are "boosted" (reviewed), or similar programming is offered possibly throughout high school. Almost no research exists regarding the effectiveness of booster programming with high-risk youth. The followup project will investigate the effectiveness of memory-enhanced booster programming with our new group within an expanded curriculum. One of the primary advances in research on human memory in the past two decades has been the accumulation of a large and compelling body of empirical support for cue-dependent retrieval and accessibility processes in human memory. Every current, major theory of human memory now incorporates such processes, while earlier theories of memory focused primarily on acquisition or encoding processes. One of the most well-supported, specific principles summarizing the notion of cue-dependent retrieval is the encoding specificity principle (Tulving, 1983). In terms of information learned in a drug abuse prevention program, this principle means that information acquired in a program will be accessible from memory in a given situation only if the situation contains features that overlap with features of the program information stored in memory. Beginning Year 2 of the renewal (1998), we provided the first test of a novel approach to booster programming with the new study group of students. A model based on these important advances in memory research is being used in this study. Both a design to assess immediate effects of this booster programming on memory access, and utilization of a design to assess longer-term effects (over three years), will be implemented.
Summary of Project Towards No Drug Abuse Results

The significance of our findings to the scientific field and their potential impact on health, so far, include:

1) Prevalence of drug use among continuation high school students is much higher than students from regular high schools. This is a context in which prevention efforts are needed, and which serves as a natural laboratory in which high-risk youth can be studied over a long period of time.

2) Generic social influences programming is not preferred by continuation high school students. Some social influences programming can be adapted to them (e.g., effective communication and decision making), but the addition of prosocial coping, recovery movement ideas, motivational activities, and social cognitive error correction programming are needed (i.e., motivation-skills-decision making model).

3) It is possible to consent, collect data, and track youth from this high-risk sample.

4) Continuation high school students attend approximately two-thirds of their drug abuse prevention lessons with no decreased attendance over time, show learning of Towards No Drug Abuse material relative to the standard care condition, and report high interest and belief in the material. A school-as-community component can be implemented successfully, but it does not appear to add much effect to that of a classroom-only program. Effects on hard drug use and alcohol use have been achieved at one-year follow-up, using this motivation-skills-decision making model. Some effects last up to 3-years post-programming, among females.

5) Such programming can be adapted to youth in other contexts (thus far, regular high school youth).

6) It is possible to develop a self-instruction version of the Towards No Drug Abuse program; comparative results are forthcoming.

References


Flay, B.R. (1986). Efficacy and effectiveness trials (and other phases of research) in the development of health promotion programs. Preventive Medicine, 15, 451-474.


