Research Plan Outline

1) **Specific Aims:** Your project objectives listed one by one

2) **Significance and Background:** Literature review
    a) **Statement of the Problem of Drug Abuse:** Background
    b) **Cognitive, Affective, and Alternative Approaches:** Development of prevention approaches
    c) **Psychosocial Prevention Approaches:** Approaches focusing on psychosocial factors
    d) **The _LST_ Approach:** Background on _LST_ program
    e) **The Importance of High Quality Provider Training:** Importance of the implementation of prevention programs with fidelity

3) **Relevant Experience/Preliminary Studies:** PI's experience and previous work
    a) **Principal Investigator's Experience:** Written in text and specify how PI has the credentials to supervise and direct this project
    b) **Institution's Background and Previous Work:** List and summarize each study and funded project conducted by your institution

4) **Experimental Design and Methods**
    a) **Description of LST Prevention Model: Describes the purpose of LST**

    b) **Study Population**

    c) **Research Design**

    d) **Evaluation**   **"SPECIFIC TO POPULATION AND GRANT"**

    e) **Data Collection**

    f) **Statistical Analysis**

5) **INCLUSION OF WOMEN AND MINORITIES IN RESEARCH INVOLVING HUMAN SUBJECTS**

RESEARCH PLAN

SPECIFIC AIMS

This application requests X (yrs or months) of support for the implementation of a state-of-the-art drug abuse prevention program called *Life Skills Training (LST)*. *LST* is a school-based drug abuse prevention program targeting students in both elementary and middle schools. Results from a recent study testing the elementary prevention program found that it decreased cigarette smoking by 60% in elementary school students. The effectiveness of the *LST* approach has been well established with over 20 years of rigorous empirical research, including a randomized trial with six-year long-term follow-up data.

The aims of this proposal are: (list specific aims)

Significance

Statement of the Problem of Drug Abuse

Despite the best efforts of teachers, parents, community leaders, and health professionals, adolescent drug use in the United States remains the highest in the industrialized world. Moreover, since 1992, national surveys have shown an alarming increase in drug use among American youth (Johnston, O'Malley, & Bachman, 2000). Perhaps most frightening of all, this rise has been attributed to an increase in substance use/abuse among the very youngest cohorts. The most recent data show that by the end of eighth grade, 35% of all students have tried an illicit drug. By the end of high school, approximately one-half of the students have done so. While many theories have been advanced to explain this upward trend, one thing is clear--action must be taken to change it. Attempts to develop effective treatment programs have been costly, difficult, and only moderately successful (Dusenbury & Khuri, 1992). As a consequence, increasing emphasis has been placed on prevention including public education campaigns, school-based approaches, legislation restricting availability and use of drugs, and approaches targeting the family (Botvin & Botvin, 1992).

The initiation of cigarette smoking occurs during adolescence and is the result of a combination of cognitive, attitudinal, social, personality, pharmacologic, and developmental factors (Botvin, 1990). For many individuals, cigarette smoking is limited to a brief period of experimentation. However, for some individuals, experimentation with tobacco eventuates in addictive patterns of use characterized by psychological and physical dependence. Cigarette smoking has not only been linked to a number of chronic diseases, but for some individuals it may be a precursor to the use of alcohol and other drugs (Millman & Botvin, 1992). The use of psychoactive substances during childhood and adolescence can lead to academic, social, and emotional problems and interfere with normal psychosocial development.

While significant progress has been made in developing effective research-based approaches for drug abuse prevention over the past two decades, little attention has been devoted to the importance of developing accessible and affordable training technologies, specifically multimedia educational software for prevention approaches derived from that research. It is crucial to combine the latest research concerning effective drug prevention programs with technologies and effective training methods to combat current high rates of adolescent drug use in the United States. Hence, proven smoking and drug prevention programs need to be disseminated using appropriate and affordable technological means to effectively reach our youth and educators, thus contributing to a reduction in this major public health problem.

Cognitive, Affective, and Alternative Approaches

Although the ultimate goal of prevention approaches is to decrease drug abuse and its adverse consequences, the focus of prevention programs has been on early-stage drug use and related risk and protective factors (Botvin, 2000). Hence, evaluation studies have examined the impact of various prevention approaches on hypothesized risk and protective factors and, to a lesser extent, on drug use behavior. The most widely utilized drug abuse prevention approaches have typically relied on: a) the presentation of factual information concerning the adverse consequences of using drugs; b) efforts to promote effective skill development through experiential classroom activities; or, c) involvement in organized youth activities to provide positive alternatives to drug use. Studies evaluating the effectiveness of these approaches have consistently indicated that they do little to impact drug use behavior (Berberian, Gross, Lovejoy, & Paparella, 1976; Braucht et al., 1973; Dorn & Thompson, 1976; Goodstadt, 1974; Richards, 1969; Schaps, Bartolo, Moskowitz, Palley & Churgin, 1981; Swisher & Hoffman, 1975). There is even some evidence that approaches which attempt to dissuade adolescents from becoming involved with drugs by providing them with factual information concerning the consequences of drug use may actually lead to *increased* drug use, possibly because such approaches may serve to stimulate curiosity (e.g., Braucht & Braucht, 1984; Goodstadt, 1980).

Psychosocial Prevention Approaches

Meta-analyses of drug abuse prevention evaluation studies indicate that approaches which focus on the psychosocial factors implicated in the initiation of drug use are more effective than traditional didactic approaches (e.g., Bangert-Drowns, 1988; Bruvold & Rundall, 1988; Tobler, 1986). Based on social learning theory (Bandura, 1977), communications theory (McGuire, 1964), and problem behavior theory (Jessor & Jessor, 1977), contemporary psychosocial approaches to drug abuse prevention place primary emphasis on increasing awareness of social influences promoting drug use and teaching specific techniques for resisting such pressures. However, a limitation of these approaches is that they largely assume that adolescents are motivated to resist social influences to use drugs and merely lack the skills. Unfortunately, many adolescents may actually be motivated to use drugs and may actively seek out other like-minded youth. Consequently, to be effective, prevention programs must deal with both the skills necessary for resisting social influences to use drugs and potential motivations for using drugs. This suggests the need for a more comprehensive prevention approach capable of targeting the intrapersonal determinants of adolescent drug use as well as the interpersonal or social determinants.

The Life Skills Training Approach

One of the most successful lines of tobacco, alcohol, and drug abuse prevention research has been conducted by Botvin and his colleagues at Cornell University Medical College using the school-based approach *Life Skills Training (LST)*. The *LST* approach was designed to address the factors promoting drug use in a more comprehensive fashion (e.g., Botvin & Eng, 1982; Botvin, Baker, Renick, Filazzola & Botvin, 1984; Botvin, Baker, Botvin, Filazzola & Millman, 1984; Botvin, Renick & Baker, 1983; Botvin, Baker, Dusenbury, Tortu & Botvin, 1990). Regarding drug use as part of a general tendency toward problem behavior as conceptualized by Jessor (1982), this prevention strategy teaches a variety of personal self-management skills and social skills in order to increase general competence and reduce potential motivations to use drugs--in addition to teaching skills and knowledge that are specific to resisting social influences to engage in drug use. Thus, a distinguishing feature of this approach is its emphasis on teaching generic skills with broad applicability to various situations and problems in order to facilitate generalization to a variety of problem behaviors.

Middle School Program: The findings of studies assessing the efficacy of the *LST* approach indicate that it can reduce tobacco, alcohol, and marijuana use by up to 87% in middle school students (Botvin et al., 1995). Prevention effects can be produced by a variety of providers

including project staff, peer leaders, and classroom teachers (Botvin, Eng, & Williams, 1980; Botvin & Eng, 1980; Botvin, Baker, Renick, Filazzola & Botvin, 1984; Botvin, Baker, Botvin, Filazzola & Millman, 1984; Botvin, Renick & Baker, 1983). Moreover, this approach has been found to have a significant impact on several cognitive, attitudinal, and personality variables hypothesized to mediate the impact of the intervention on drug use. Evidence also exists indicating that booster sessions help maintain and even enhance intervention effects (Botvin et al, 1983; Botvin, Baker, Filazzola, & Botvin, 1991).

Although most studies testing contemporary prevention approaches provide only short-term follow-up, long-term data are available for the *LST* approach from a large-scale randomized trial involving 56 schools and nearly 6,000 adolescents. Published data reporting the first three years of this study (from the 7th grade to the end of the 9th grade) indicated that this approach produced significant reductions in drug use (Botvin, Baker, Dusenbury, Tortu & Botvin, 1990). A follow-up study funded by NIDA provided additional evidence of the durability of these effects over 6 years by extending follow-up to the end of the 12th grade (Botvin, Baker, Dusenbury, Botvin & Diaz, 1995). Furthermore, 6 ½ year follow-up data collected after high school (Botvin, Griffin, Diaz, Scheier, Williams, & Epstein, 2000) found significant reductions in the use of illicit drugs (marijuana, psychedelics, and narcotics).
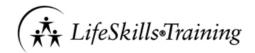
The junior high school LST model is 15-week structured to include a primary year of intervention (typically implemented in grade 7) and two additional years of booster sessions (grades 8 and 9). The two booster years are designed to review and reinforce the material covered during the first year intervention. As in the first year, the booster sessions focuses on domain-specific knowledge and skills to enable students to deal more effectively with social influences to smoke cigarettes. The booster sessions also teach generic personal and social skills to enable students to more effectively deal with life as an adolescent. Booster interventions consist of 10 class sessions in the second year and 5 class sessions in the third year.

Elementary School Program. The *LST* middle school program provides a foundation upon which the *LST* program for elementary school students is based, thereby increasing its potential for producing lasting reductions in smoking. The elementary school materials were developed with SBIR Phase I and II funding from NCI and are designed to be used both either alone or in combination with the junior high school *LST* curriculum. The program has been evaluated and found to decrease the risk of smoking involvement. Elementary school students are taught in grades 4, 5, and 6 the important self-management skills and social skills necessary to form and maintain healthy social relationships and cope with the many challenges of adolescent life. It also includes age-appropriate information concerning tobacco and its effects as well as material designed to establish non-smoking norms. Results from a study testing the *LST* elementary school curriculum found that it decreases cigarette smoking by 60% as well as producing a reduction in alcohol use, increased self-esteem, changed smoking attitudes, and improved important life skills (Botvin, 2000; Botvin, Scheier, Griffin, in press; Botvin, Griffin, Macaualy, Paul, in preparation).

The *LST* elementary school curriculum consists of 24 class sessions (approximately 30-45 minutes each) to be conducted over three years. The first year is composed of eight class sessions and covers all skill areas. The remainder of the program is conceptualized as "booster sessions" and is divided into eight class sessions for year 2 and eight class sessions for year 3. The booster sessions provide additional skill development and opportunities to practice in key areas. The first year of the program is designed for either grade 3 or 4, depending on when the transition from elementary to middle or junior high school begins.

The Importance of High Quality Provider Training

As the prevention field faces the challenge of translating the results of recent research into practice, a growing concern is the extent to which prevention providers implement research-

based programs in a manner that is faithful to the particular approach. Prevention programs cannot significantly reduce substance abuse among students unless they are implemented effectively (Scheirer, 1983). A study by Basen-Engquist et al. (1994) showed that trained providers implemented curricula at higher levels of fidelity than those not trained. Research by Botvin et al. (1990; 1995) also underscores the importance of implementation fidelity for producing reductions in the prevalence of tobacco, alcohol, and illicit drug use, using a state-of-the-art, research-based prevention approach. The findings of this research indicate that the highest reduction in smoking and other drug use is clearly demonstrated in the groups of students whose teachers have received *LST* provider training as compared to those who implemented the program without provider training or a control group who did not receive the *LST* program. Therefore, the impact a school-based curriculum has on students relies heavily on the successful implementation of effective prevention programs, such as *LST*. One way to communicate the significance of program fidelity to teachers is through the training process where they gain a full understanding of the value of implementing the program faithfully. For this reason, teacher training is viewed as pivotal in achieving the objectives of drug education curricula (Newman, Mohr, Badger & Gillespie, 1984). Training providers to teach smoking and drug prevention curricula is essential to maintain program fidelity, enhance teacher ability to impact information and skills, and ultimately produce greater overall reductions in substance use among their students.

Studies show that teachers trained in drug education curricula reported feeling more self-assured about the content of their lessons and in discussing drugs and alcohol with students (Dewit, Birchmore, Timney, Silverman & Stevens-Lavigne, 1996). Trained providers also reported feeling better prepared to teach the curriculum, and thus were more faithful in maintaining program fidelity (Parcel, Ross, Lavin, Portnoy, Nelson & Winters, 1991). Basen-Engquist et al., (1994) revealed that students of trained providers scored higher on knowledge and attitude assessments than students of untrained providers. Also, by being trained in drug education curricula, providers were able to more readily recognize signs of early drug use in their students (Dewit, Birchmore, Timney, Silverman & Stevens-Lavigne, 1996).

Without question, a successfully implemented drug education program relies heavily on the quality of its provider training. Hence, to maintain a more lasting impact on students, it is imperative for drug abuse prevention training programs to offer provider training in a standardized format so as to maintain fidelity of program implementation as well as to provide an alternative affordable option for schools with financial barriers.
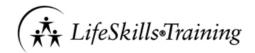
RELEVANT EXPERIENCE/PRELIMINARY STUDIES

Principal Investigator's Experience

Institution's Background and Previous Work

EXPERIMENTAL DESIGN AND METHODS

Description of the LST Prevention Model

The main purpose of the LST approach in its original form is to facilitate the development of personal and social skills, with particular emphasis on the development of skills for coping with social influences to smoke cigarettes. Recognizing the developmental trajectory of smoking initiation and the need to provide age-appropriate material, the elementary school curriculum materials will place considerably less emphasis on issues related specifically to skills for resisting smoking pressures than the junior high school version. Instead, the emphasis will be primarily on generic life skills and age-appropriate information about tobacco and tobacco use. Students will be~ taught cognitive-behavioral skills for building self-esteem, resisting advertising pressure,

managing anxiety, communicating effectively, developing personal relationships, and asserting one's rights. These skills are typically taught using a combination of teaching techniques including demonstration, behavioral rehearsal, feedback and reinforcement, and behavioral "homework" assignments for out-of-class practice.

In addition to teaching skills for the enhancement of generic personal and social competence, students are taught problem-specific skills and knowledge related to smoking. For example, students are taught the application of general assertive skills to situations in which they might experience direct interpersonal pressure to smoke cigarettes. In addition, unlike traditional prevention approaches, only minimal information concerning the long-term health consequences of smoking will be provided.   Instead, information hypothesized to be more salient to children and relevant to prevention will be provided including information concerning the immediate negative consequences of tobacco use, the decreasing social acceptability of use, and actual prevalence rates among children, adults, and adolescents.

The materials used in evaluation research with the LST approach have included teacher's manuals and student handouts/worksheets for each year of the intervention and a 15-minute relaxation audiotape. Table I provides a brief overview of the content and structure of the junior high school LST intervention (See Appendix). A description of the original prevention strategy and the curriculum materials can be found elsewhere (e.g., Botvin & Tortu, 1988; Botvin & Dusenbury, 1987).

Study Population

Research Design

Evaluation

Data Collection

Statistical Analysis

INCLUSION OF WOMEN AND MINORITIES IN RESEARCH INVOLVING HUMAN SUBJECTS

In order to comply with the NIH/ADAMHA policy concerning the inclusion of women and minorities in research projects and ensure representation of the three major ethnic/racial groups in the US, the focus group participants will be half male and half female, and 20% Black, 20% Hispanic, and 60% white.

HUMAN SUBJECTS

During this proposed project the only human subjects to be involved will be the X participants. Thus, this project qualifies for Exemption #2 under 45 CFR 46 regarding the Protection of Human Subjects. The focus groups will have the following composition: 50% male/50% female, 20% black, 20% Hispanic, and 60% white

APPENDIX

Table 1. *LifeSkills Training* **Middle School Program Description**

Number of Sessions	Topic	Description
2	Smoking: Myths and Realities	Common attitudes and beliefs about smoking; current prevalence rates of smoking among adults and teenagers; the social acceptability of cigarette smoking; the process of becoming a regular (habitual) smoker, and the difficulty of breaking the smoking habit; the immediate physiological effects of smoking
2	Decision-Making and Independent Thinking	Discussion of routine decision-making; description of a general decision-making strategy, including consideration of alternatives available; social influences affecting decisions; recognizing persuasive tactics; and the importance of independent thinking.
2	Media Influences and Advertising Techniques	Discussion of media influences on behavior; advertising techniques and the manipulation of consumer behavior; formulating counter-arguments and other cognitive strategies for resisting advertising pressure; cigarette advertising as case studies in the use of these techniques.
2	Self-Image and Self-Improvement	Discussion of self-image and how it is formed; the relationship between self-image and behavior; the importance of a positive self-image; alternative methods of improving one's self and self-image; beginning a self-improvement project.
2	Coping With Anxiety	Discussion of common anxiety-inducing situations; demonstration and practice of cognitive-behavioral techniques for coping with anxiety; instruction on the application of these techniques to everyday situations as active coping strategies.
2	Communication Skills	Discussion of the communication process; distinguishing between verbal and non-verbal communication; techniques for avoiding misunderstandings.
1	Social Skills (A)	Discussion on overcoming shyness; initiating social contacts, giving and receiving compliments; basic conversational skills: initiating, sustaining and ending conversations.
1	Social Skills (B)	Discussion of boy-girl relationships and the nature of attraction; conversing with the opposite sex; social activities and asking someone out for a date.
2	Assertiveness	Situations calling for assertiveness, reasons for not being assertive, verbal and nonverbal assertive skills, resisting peer pressures to smoke cigarettes.

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