

FLORIDA EDUCATIONAL  
RESEARCH COUNCIL, INC.

# RESEARCH BULLETIN



THE EFFECTS OF THE  
*TOO GOOD FOR DRUGS II* DRUG PREVENTION PROGRAM  
ON STUDENTS' SUBSTANCE USE INTENTIONS  
AND RISK AND PROTECTIVE FACTORS

Tina P. Bacon

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Volume 31      FALL/WINTER      No. 3 and No. 4

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OCTOBER, 2000

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## FERC NOTES ON THIS BULLETIN

A perennial problem for public schools has been to develop and implement drug education programs that are effective, especially over time. This study was conducted at the middle school level and the schools selected in the study were somewhat typical of most middle schools in Florida, if not the nation. It appears that this program was effective and merits consideration by other school districts in need of such a program.

Charlie T. Council  
Executive Director  
Florida Educational Research Council

THE FERC RESEARCH BULLETIN IS REFEREED BY REVIEWERS FROM TEN UNIVERSITIES, THE FLORIDA DEPARTMENT OF EDUCATION AND THIRTY SCHOOL DISTRICTS IN FLORIDA.

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## Research Summary

### Effects of the *Too Good for Drugs II* Prevention Program

Children's and youth's experimentation or use of alcohol, tobacco and other drugs have been a social, educational and inter- and intra-personal concern for decades. The contributors and reasons for young people's substance use, and the consequences to the individual and the communities around them, are complex and multifaceted. Effective school-based prevention programs have been identified as one of the important and useful interventions to the overall substance prevention effort.

As a piece of the entire prevention and intervention pie, prior research guides current trends in school-based drug prevention programs to maximize their utility and impact on young people's behaviors and perceptions. The *Too Good for Drugs II* K-8 curriculum was developed based on the merging of federal, state and prevention agency guidelines as well as research findings of studies using the social influence model and the cognitive-behavioral model for school-based drug prevention programs.

The purpose of this study was to examine the effectiveness of the *Too Good for Drugs II* (TGFD II) program in impacting young people's substance use intentions, attitudes and perceptions. Examining the TGFD II program, using a research design, lays the foundation for the program to document its scientifically-defensible use of "best practices and strategies" identified in the substance prevention field.

The study intended to examine the following hypotheses. Students receiving the TGFD II prevention program in comparison to control students will: (a) indicate fewer intentions of smoking cigarettes, drinking alcoholic beverages and using marijuana within the next 12 months; (b) have higher levels of peer resistance skills; (c) have more positive attitudes regarding the inappropriateness of substance use; (d) be more knowledgeable of the prevalence of peer substance use; (e) have more positive perceptions of peer disapproval of substance use; (f) form friendships with peers less likely to engage in substance use behaviors; and (g) indicate higher levels of internal locus of control/self-efficacy.

## Method

Six middle schools from a large Florida school district were randomly selected and recruited for participation in this study. The school district serves students in a 200 square mile region encompassing urban, rural and suburban areas. One thousand three hundred and eighteen (1318) sixth grade students participated in the pretest and posttest phase of the study. The total sample was 52% female, approximately 48% White, 33% African-American, 13% Hispanic and 6% Asian, and 51% of the sample were categorized as economically challenged by status of receipt of free or reduced lunches.

Students in three of the middle schools participated in the prevention program during the first quarter of the school year, and students in the other three schools served as the control sample for the study. It should be noted that students in the control group were not denied access to services; the prevention program was offered to them at the end of the study during the fourth quarter of the school year.

All students in the treatment and control sample were pretested, using a survey questionnaire at the beginning of the school year, prior to delivery of the TGFD II prevention program. A posttest questionnaire was administered at the end of the first nine-week period (Fall 1999) immediately following the delivery of the prevention curriculum and once again 20 weeks (Spring 2000) after the treatment delivery period. The prevention program was delivered to students in the treatment schools in their assigned science class in 40-50 minute lessons once a week over a nine-week period by trained TGFD II instructors.

## Results

1. Given that school-based drug prevention programs are a piece of the broad spectrum of prevention/intervention strategies, their usefulness, benefit or contribution to healthy growth and decision-making on the part of young people is highly dependent on the integrity, potency and commitment in which it is delivered and maintained. Prevention research shows a direct relationship between the quality of program implementation and the program's potential to impact participants. In this study, classroom teachers' responses to items on a survey questionnaire suggest the **TGFD II program was**

implemented as planned with a high degree of quality and fidelity to curriculum content and learning activities.

2. **Prior to delivery of the *Too Good for Drugs II* program, students in treatment and control schools indicated similar levels of intentions to use/not use tobacco, alcohol or marijuana within the next 12 months.** When sixth grade students were asked, at the beginning of the school year, how strongly they agreed or disagreed with statements about their intentions to use substances, 93.83% agreed or strongly agreed that they did not plan to use tobacco; 81.87% indicated they did not plan to use alcohol; and 93.72% indicated they did not intend to use marijuana.
3. Following program delivery and again 20 weeks later, item responses for students who were not using and did not intend to use substances were reexamined. **Immediately following program implementation, students participating in the TGFD II program evidenced positive differences in comparison to the control group. Positive effects continued to be observed 20 weeks later. Student responses suggest the following:**

a. **INTENTIONS TO SMOKE CIGARETTES**

**After program delivery,**

students participating in TGFD II indicated 33% fewer intentions to smoke than did students in the control group.

**Twenty weeks later,**

positive effects continued to be observed, with 22% fewer TGFD II students indicating undesirable changes in their intentions to use tobacco, in comparison to the control group.

b. **INTENTIONS TO DRINK ALCOHOL**

**After program delivery,**

students participating in TGFD II indicated 38% fewer intentions to drink alcohol than did students in the control group.

**Twenty weeks later,**

positive effects continued to be observed, with 14% fewer TGFD II students indicating undesirable changes in their intentions to use alcohol, in comparison to the control group.

**c. INTENTIONS TO SMOKE MARIJUANA**

**After program delivery,**

students participating in TGFD II indicated 25% fewer intentions to smoke marijuana than did students in the control group.

**Twenty weeks later,**

positive effects continued to be observed, with 30% fewer TGFD II students indicating undesirable changes in their intentions to use marijuana, in comparison to the control group.

4. Prevention research has identified certain risk factors that increase the likelihood that a student will use drugs and certain protective factors that decrease or buffer the impact of the risk factors. The TGFD II program incorporates curriculum and instructional activities aimed at reducing risk factors and building protective factors. The following risk and protective factors were examined in this study: Perceptions of Peer Resistance Skills; Positive Attitudes toward Nondrug Use; Perceptions of Peer Normative Substance Use; Perceptions of Peer Disapproval of Substance Use; Association with Prosocial Peers; and Perceptions of Locus of Control/Self-Efficacy.

**Student responses to risk and protective survey items at the end of program and again at the 20-week follow-up suggest the following:**

- a. Students participating in the TGFD II program had statistically significant higher scores or more positive perceptions of their **peer resistance skills** in comparison to students in the control group ( 9-week and 20-week testing).

- b. Students participating in the TGFD II program had statistically significant higher scores or more **appropriate attitudes regarding drug use** in comparison to students in the control group ( 9-week testing).
  - c. Students participating in the TGFD II program had statistically significant higher scores or were more **knowledgeable of actual rates of substance use among youth in their age group** (peer norms) in comparison to students in the control group ( 9-week and 20-week testing).
  - d. Students participating in the TGFD II program had statistically significant higher scores or thought their **peer group was less accepting of tobacco, alcohol or marijuana use** in comparison to students in the control group ( 9-week and 20-week testing).
  - e. Students participating in the TGFD II program had statistically significant higher scores or formed **friendships with peers less likely to engage in substance use behaviors** in comparison to students in the control group ( 9-week testing).
  - f. Students participating in the TGFD II program had statistically significant higher scores or higher levels of **locus of control/self-efficacy** in comparison to students in the control group ( 9-week and 20-week testing).
5. In summary, the TGFD II program evidence positive effects on sixth grade students' intentions to use tobacco, alcohol and marijuana. The program was also successful in impacting students' risk and protective factors associated with strengthening young people's abilities to make positive, healthy decisions. The impact of the TGFD II program on students' intentions, perceptions and attitudes was similar to effects observed with other "science-based" school-based prevention programs noted in the literature.
6. TGFD II program's strengths as well as its challenges are mirrored in other "proven" prevention programs' research. Those challenges include, primarily, the tendency for some substance use behaviors

and risk and protective factors to degrade or lessen over time, in combination with adolescents' maturational process including peer pressure and tolerance for risk-taking behaviors. It is a reminder to educators that prevention curriculum cannot be a one-shot deal, but must be an ongoing process within and across school years. It is also a reminder that schools and educators cannot, in isolation, help young people with the challenges they face, but must collaborate and coordinate with the whole community of prevention and intervention efforts offered by other agencies, institutions, neighborhoods and families.

## Introduction

This study was conducted to examine the effects of the *Too Good for Drugs II* (Mendez Foundation, Inc., 1998) school-based drug prevention program on sixth grade students' substance use behaviors and risk and protective factors. For the reader who may be unfamiliar with the *Too Good for Drugs II* (TGFD II) prevention program, a brief description of the K-8 curriculum is provided first, followed by a summary of the theoretical framework for the program's development. The remainder of the paper is presented using the following research sections: purpose of the study; method, design and procedures; results, and conclusions.

## Program Description

The *Too Good for Drugs II* Program is a K-8 multifaceted, interactive social influence intervention using a universal education strategy. The *Too Good for Drugs II* program curriculum and its companion programs, *Too Good for Drugs and Violence in High School* and *Peaceable Place*, are currently used in more than 2000 school districts across 48 states. The TGFD II curriculum is shared in 10 lesson units at each grade level by a trained classroom teacher or a TGFD II instructor. The program is designed to benefit everyone in the school by providing needed education in social and emotional competencies and by reducing risk factors and building protective factors that affect most, if not all students in this age group. Instructional strategies strongly emphasize cooperative learning activities, role play situations, and skills-building methods including modeling, practicing, reinforcing, providing feedback, and promoting generalization of skills to other contexts. The program is a long-term intervention which builds skills sequentially with the intention of preventing alcohol, tobacco and other drug (ATOD) use and promoting healthy decision-making and positive, healthy youth development. The program also encourages and includes strategies for: (a) infusing prevention concepts and skills in the classroom on an ongoing basis; (b) involving community partners; and (c) involving parents in the prevention process through "Home Workouts: Exercises for Parents and Kids" and information sheets to promote family discussions.

## **Theoretical Background**

Evidence from a number of sources indicates that alcohol, tobacco and other drug (ATOD) use is a complex problem with many contributing factors. Individuals use drugs, or abstain from using them, for a variety of reasons. ATOD prevention, therefore, requires complex interventions utilizing many strategies.

*Too Good for Drugs II* is a multifaceted prevention program based on a number of theoretical constructs which have been strongly supported by research in the field. Elements of Social Learning Theory (Bandura, 1977); Problem Behavior Theory (Jessor and Jessor, 1977; Jessor, 1982; Perry and Jessor, 1983); and Social Development Theory (Hawkins & Weis, 1985; Hawkins, Lishner, Catalano & Howard, 1986) contribute to the theoretical basis for *Too Good for Drugs II* (TGFD II). In addition to these theories, TGFD II uses strategies based on the Developmental Assets (Search Institute, 1996) approach to healthy youth development. The following paragraphs describe the relevance of these theories and models to TGFD II.

According to Social Learning Theory, drug use is a socially learned, purposeful behavior, which is shaped primarily through modeling, or observing behaviors and reinforcement, or experiencing positive consequences for behavior. Modeling contributes to the acquisition of both prosocial and antisocial behaviors. This theory is based on a self-efficacy paradigm in which behavior change and maintenance depend on: (a) expectations about the outcomes of engaging in the behavior, and; (b) a sense of self-efficacy, or expectations about one's ability to engage in the behavior. From this perspective, alcohol and other drug use results from the interplay of social-environmental influences and personal perceptions.

TGFD II utilizes Social Learning Theory by addressing social influences such as peers, advertising and media and correcting misperception of social norms; persuading students of the value of pro-social behaviors; emphasizing the development of social and personal skills to resist social and environmental pressures to use drugs; modeling pro-social skills, offering opportunities to perform the skills and providing rewards and recognition for using them.

From the perspective of Problem Behavior Theory, drug use and other highly correlated behaviors form a syndrome of purposive behaviors which are psychologically functional for many adolescents. Problem Behavior Theory posits that efforts to change behavior may focus on any or all of the following levels: behavior, personality and environment. An



extension of this Theory, Health Behavior Theory (Perry and Jessor, 1983), proposes that strategies be used to introduce or strengthen health-enhancing behaviors and simultaneously weaken or eliminate health-compromising behaviors. This theoretical approach suggests that: (a) prevention efforts should pay more attention to the larger environment, including social norms and social supports regulating the occurrence of behaviors; and (b) interventions should focus on multiple behavioral targets.

Some of the assumptions underlying TGFD II are based on Problem Behavior Theory and Health Behavior Theory. For Example, TGFD II provides normative education, teacher tips and a parent component for making the school and family environments more supportive of drug-free choices. TGFD II provides role-play and decision-making scenarios not only dealing with ATOD use, but with other highly correlated problem behaviors as well.

Social Development also contributes to the theoretical assumptions upon which TGFD II is based. The Social Development Model is an integration of Social Control and Social Learning Theory. The Social Development Model emphasizes the importance of protective factors: (a) bonding to prosocial family, school, peers and community; and (b) clear standards or norms of behavior. According to this model, positive socialization is achieved when youths have the opportunity to be involved in conforming activities, when they develop skills necessary to be successfully involved, and when those with whom they interact consistently reward desired behaviors. These conditions would increase attachment to others, commitment to conforming behavior, and belief in the conventional order.

TGFD II is based on the Social Development Model, in that it builds protective factors, including bonding and norms. TGFD II teaches skills and provides opportunities and rewards/recognition for participation. It emphasizes prosocial norms, providing activities and information to counter students' misperceptions regarding the actual level of drug use, and strongly supporting healthy normative beliefs and clear standards. It sends a clear, no-use message for students: You are "Too Good for Drugs."

In addition, the Developmental Assets Framework suggests positive, healthy youth development depends on the presence of developmental assets, 40 building blocks that all children and adolescents need to grow up healthy, competent and caring. These assets are internal (ie., educational commitment, values, social competencies and positive identity) and external (i.e., support, empowerment, boundaries and expectations,

time). Their effect is cumulative; the more assets young people have, the more resilient they will be, and the more engaged in positive behaviors. The fewer assets they have, the more likely they are to become involved with drugs, violence and other antisocial behaviors.

TGFD II is based on many assumptions consistent with the Developmental Assets Framework, including a proactive, positive focus and a commitment to long-term building of internal and external assets for all students, regardless of their risk. The goal of *Too Good for Drugs II* is not only to prevent problem behavior, but to promote a positive, healthy youth development.

### **Purpose of Study**

Children's and youth's experimentation or use of alcohol, tobacco and other drugs have been a social, educational and inter- and intra-personal concern for decades (Berberian et al., 1976). The contributors and reasons for young people's substance use and the consequences to the individual and the communities around them are complex and multifaceted (Brounstein et al., 1998). Effective school-based prevention programs have been identified as one of the important and useful interventions to the overall substance prevention effort (Summerfield, 1995).

As a piece of the entire prevention and intervention pie, prior research guides current trends in school-based drug prevention programs to maximize their utility and impact on young people's behaviors and perceptions (Drug Strategies Inc., 1999). The *Too Good for Drugs II* K-8 curriculum was developed, based on the merging of federal, state and prevention agency guidelines as well as research findings of studies using the social influence model (Evans, 1976; Evans et al., 1978; Luepker et al., 1983) and the cognitive-behavioral model (Botvin, 1982; Botvin & Dusenbury, 1987; Botvin & Tortu, 1988; Botvin et al., 1990; Ellickson & Bell, 1990) for school-based drug prevention programs.

The purpose of this study was to examine the effectiveness of the TGFD II program in impacting young people's substance use intentions, attitudes and perceptions. Examining the TGFD II program, using a research design, lays the foundation for the program to document its scientifically-defensible use of "best practices and strategies" identified in the substance prevention field. "Best Practices are those strategies and programs which are deemed research-based by scientists and researchers at the National Institute for Drug Abuse (NIDA), the national Center for Substance Abuse Prevention (CSAP), National Center for the Advance-

ment of Prevention (NCAP), National Office of Juvenile Justice and Delinquency Prevention (OJJDP) and/or the national Department of Education (DOE). These are strategies and programs which have been shown through substantial research and evaluation to be effective at preventing and /or delaying substance abuse (CAPT, 2000)."

The study intended to examine the following hypotheses. Students receiving the TGFD II prevention program, in comparison to control students, will: (a) indicate fewer intentions of smoking cigarettes, drinking alcoholic beverages and using marijuana within the next 12 months; (b) have higher levels of peer resistance skills; (c) have more positive attitudes regarding the inappropriateness of substance use; (d) be more knowledgeable of the prevalence of peer substance use; (e) have more positive perceptions of peer disapproval of substance use; (f) form friendships with peers less likely to engage in substance use behaviors; and (g) indicate higher levels of internal locus of control or self-efficacy.

## **Method**

### Sample

Six middle schools from a large Florida school district were randomly selected and recruited for participation in this study. The school district serves students in a 200 square mile region encompassing urban, rural and suburban areas. One thousand three hundred and eighteen (1318) sixth grade students participated in the pretest and posttest phase of the study. The total sample was 52% female, approximately 48% White, 33% African-American, 13% Hispanic and 6% Asian, and 51% of the sample was categorized as economically challenged by status of receipt of free or reduced lunches. Eighty-four percent (n=1106) of the sample participated in the 20-week follow up.

### Design

The district's middle schools were stratified on school ratings based on State criteria of academic performance, learning environment and student characteristics. Consideration was also given to location (urban, rural and suburban) and school size. Three levels of stratification were identified and two schools for each matched level were randomly assigned to either the treatment or control condition. Students in three of the middle schools participated in the prevention program during the first quarter of the school year, and students in the other three schools served

as the control sample for the study. It should be noted that students in the control group were not denied access to services; the prevention program was offered to them at the end of the study during the fourth quarter of the school year.

### Prevention Program

The TGFD II sixth grade curriculum used in this study included nine lesson units delivered to students participating in the treatment condition by program instructors. The sixth grade curriculum is designed to develop: (a) personal and interpersonal skills to resist internal and external pressures to use drugs; (b) goal setting, decision-making, assertiveness and effective communication skills; (c) knowledge about the negative consequences of ATOD use and the benefits of a drug-free lifestyle; and (d) knowledge about the prevalence of actual ATOD use in the comparison to perceptions of use to support positive peer norms. Teaching methods are highly interactive and engage students through the use of role-play, cooperative learning, games, small group activities and class discussions. Students are provided many opportunities to be active participants and receive recognition for their contributions and involvement. Teaching methods model and encourage bonding with prosocial others.

### Assessment of Program Implementation

Classroom teachers of students participating in the *Too Good for Drugs* program were asked to complete the "Teacher Evaluation of Program Implementation" survey questionnaire to gauge treatment fidelity and quality of implementation. Teachers responded to questions about the number of TGFD II lessons offered, length of lessons, and whether confounding programs or instruction were offered during the treatment period. Teachers were also asked to respond to 15 Likert type items (5 = Strongly Agree to 1 = Strongly Disagree) to rate TGFD II instructors' preparation, presentation and interaction with and among students during the delivery of the program treatment.

### Procedure

All students in the treatment and control sample were pretested, using a survey questionnaire at the beginning of the school year, prior to delivery of the TGFD II prevention program. Questionnaires were

administered during the homeroom period reserved for the Teachers-as-Advisors program. School administrator and teacher support was strongly solicited for the data-gathering initiative. A posttest questionnaire was administered the end of the first nine-week period immediately following the delivery of the prevention curriculum and once again 20 weeks after the treatment delivery period. Detailed instructions to standardize questionnaire administration and collection were distributed to homeroom teachers responsible for the data-gathering effort. The prevention program was delivered to students in the treatment schools in their 40-50 minute lessons once a week over a nine-week period by trained TGFD II instructors.

### Instrumentation

A pilot instrument was developed based on research findings and contributions from a variety of ATOD prevention agencies and nonpublic investigators that focus on key risk and protective factors associated with young people's ability or resiliency to face the challenges of resisting substance experimentation and use (e.g., EMT Associates, Inc., 1992; National Institute on Drug Abuse, 1997; Center for Substance Abuse Prevention, 1998). The survey questionnaire was pilot tested using a pretest-posttest design with sixth grade students in two middle schools ( $n = 558$ ). Survey items were subjected to a series of item analyses, estimates of reliability, and exploratory factor analytic techniques. Items for the research study were selected and revised based on the findings from the pilot test data and an ongoing review of research tied to the assessment process for gauging changes in youths' ATOD perceptions, attitudes and behaviors.

Student responses to the questionnaire items for the current study were again examined using a series of item analysis techniques. Three items were used to gauge students' intentions or proclivity to use tobacco, drink alcoholic beverages or use marijuana within the next 12 months ( 5-point response scale ranging from 'Strongly Agree' to 'Strongly Disagree'. Student responses to these three items were later dichotomized to represent a category of students strongly confident of their intentions to not use tobacco, alcohol or marijuana from students less certain or who may be currently using one or more of these substances.

In addition, student responses to 19 Likert type items ranging from

'Strongly Agree' to 'Strongly Disagree' were grouped into six personal risk and protective factors or mediating variables associated with impacting young people's susceptibility to substance experimentation or use. It should be noted that all item responses were recoded such that higher scores (5.0) indicate more positive perceptions or behaviors. Estimates of reliability for the total score were  $r_a = .82$  using Cronbach's alpha coefficient, and  $r_{tt} = .67$  for test-retest with a 9-week delay using control group data. Risk and protective scores were computed using the mean of the item scores for each subscale consisting of: Perceptions of Peer Resistance Skills ( $r_a = .60$ ); Positive Attitudes toward Nondrug Use ( $r_a = .55$ ); Perceptions of Peer Normative Substance Use ( $r_a = .86$ ); Perceptions or Peer Disapproval of Substance Use ( $r_a = .52$ ). Each of the risk and protective subscales contained three items with the exception of Personal Efficacy, which contained four items.

The brevity or limited number of survey questionnaire items may have many practical benefits as well as some limitations in "real world" assessment practices where teachers and students are requested to share information about themselves and program effects. No researcher or visitor to a school site or district can dispute the increasing demands on educators and students to focus on curriculum, assessment and accountability issues related to national, state and local student academic performance standards. As time becomes a continuing limited resource, ATOD prevention programs, and the assessment of such program effects, need to be infused into the classroom setting in meaningful ways that not only support student performance standards but respect time demands for gathering information. The consequences of limiting the length of the assessment tool(s) used to gauge the impact of ATOD prevention programs are the potential loss of reliability and information which may lead the examiner to fail to detect positive effects of the program.

## Results

Data was analyzed using the statistical procedures contained in SAS 6.12 (SAS Institute, Inc., 1998) for descriptive and inferential purposes. Fidelity of program implementation was examined first, followed by an analysis of student attrition rates from the posttest (Time 2) to the 20-week follow-up (Time 3), and pretest score equivalence of students' intentions to use tobacco, alcohol or marijuana for the treatment and control condition. Program effects on student outcomes were examined by focusing on changes in students' reported willingness to use ATOD

and changes in students' risk and protective scale scores.

### Program Implementation

Twenty-four school-based teachers rated the intensity and quality of program delivery for the twelve TGFD II instructors across the treatment schools. Twenty-three teachers indicated that all nine lessons were delivered to students in their classrooms, and one teacher indicated that seven of the nine lessons had been offered. Eighty-four percent of the respondents stated the TGFD II lessons averaged forty to fifty minutes, and sixteen percent indicated lessons averaged thirty to thirty-nine minutes. All of the respondents indicated that no formal classroom or school-based instruction related to substance prevention had been provided during the deliver of the TGFD II program.

Classroom teachers' responses to the items on the "Evaluation of Program Implementation" survey suggest that TGFD II instructors modeled desirable instructional behaviors such as being well prepared for lesson presentations; providing clear directions; defining complex terms and concepts; responding to students' questions; applying appropriate classroom management strategies; providing students opportunities to participate and practice skills; and recognizing and reinforcing students' participations (score range 4.88 to 5.00). Teacher responses suggest that TGFD II instructors were successful in developing a bond or rapport with students (4.79). Teachers felt the TGFD II program would have a positive influence on their students' behaviors or choices (4.88) and that students themselves had commented that they enjoyed participating in the program (4.83) and felt the activities were relevant to their daily lives (4.78). Teachers' written comments offered additional support for their positive responses to the items on the survey questionnaire.

Overall, the findings from the "Teacher Evaluation of Program Implementation" survey questionnaire suggest the TGFD II program was delivered to students as designed, covering nine lessons averaging 40 minutes each with quality instruction and adult-student and student-student interaction. Confounding influences of planned alternative substance prevention programs or effects within the treatment schools were not observed.

Attrition and Pretest Equivalence

Attrition rates are an ongoing challenge and concern for any social science study gathering information over time, and the potential bias of missing respondents on experimental results are threats to the generalization of the findings (Mohai, 1991; Botvin, et al., 1990). In this study, attrition rates did not vary substantially across the treatment or control condition, with a 16% loss of respondents for the treatment group and a 17% loss of respondents for the control group. A two-way multivariate analysis of variance (MANOVA) was conducted using treatment and attrition as independent variables and students' pretest scores on intentions to use tobacco, alcohol or marijuana within the next 12 months as dependent variables. As shown in Table 1, no significant main effects or interactive effects were found for treatment (Wilks' Lambda .997,  $df = 3, 1249$ .  $F = 1.23$ ,  $p = .299$ ), attrition (Wilks' Lambda .998,  $df = 3, 1248$ .  $F = .780$ ,  $p = .505$ ), or treatment by attrition condition (Wilks' Lambda .998,  $df = 3, 1249$ .  $F = .957$ ,  $p = .412$ ). The findings for attrition offer some confidence that the loss of student data at the end of the 20-week follow-up was not biased relative to students' predisposition towards their future substance use behaviors. Loss of respondents for the third testing period may be attributed primarily to school sites' mobility rates ranging from 30-50% and absenteeism during the follow-up testing period.

Potential differences between students' pretest scores on intentions to use tobacco, alcohol or marijuana within the next 12 months for the treatment and control group show no significant main effect for the treatment condition ((Wilks' Lambda .995,  $df = 3, 1190$ ,  $F = 2.05$ ,  $p = .111$ ), suggesting students in both groups initially held similar levels of intentions to use or not use tobacco, alcohol or marijuana in the future.



Table 1.

Characteristics of Treatment and Control Groups at Pretest and 20-week Follow Up

Variable	Pretest n = 1318		Follow Up n = 1106	
	Treatment	Control	Treatment	Control
Female	47%	51%	46%	51%
White	49%	46%	49%	46%
African American	31%	36%	32%	36%
Hispanic	13%	13%	12%	14%
Asian	7%	5%	7%	4%
Free/Reduced	56%	59%	57%	60%

Test of Equivalence of Attrition Rates by Treatment Condition

Effect	Wilks' $\Lambda$	df	F	p
Multivariate Between Effects				
Treatment	.997	3, 1249	1.23	.299
Attrition	.998	3, 1248	.780	.505
Treatment x Attrition	.999	3, 1249	9.57	.412

Mean Scores	Study		Attrition Group	
	Treatment	Control	Treatment	Control
Intention to Smoke	4.69	4.61	4.63	4.59
Intention to Drink	4.45	4.25	4.26	4.22
Intention to use Marijuana	4.74	4.69	4.73	4.61

Test of Prescore Equivalence of Intentions to Use Substances

Effect	Wilks' $\Lambda$	df	F	p
Multivariate Between Effects				
Treatment	.995	3, 1190	2.05	.112

(Means scores for treatment and control conditions reported above under 'Study Sample')

Note: Dependent variables measured on a rating scale ranging for 1.0 to 5.0. Scores are coded in reverse such that a score of 5.0 is the most positive indicating Strong Agreement to not using substances.

Intentions Toward Substance Use

It should be noted when the design of the study was developed, the decision was made not to ask student to report their personal use or frequency of use of either tobacco, alcohol or marijuana. The reason for this decision was twofold. First, the right to privacy and informed consent would require signed parental agreement for students to respond to questions of this nature. Second, the very nature of these types of questions requires youths to indicate whether they are directly engaging in illegal behaviors. Although coding procedures are available to create double-blind response procedures--where the respondent becomes a number for matching over time and neither the researcher nor the information gathered can identify the name of the individual--some students and parents may continue to have reservations about responding to these types of questions regardless of assurance of privacy. Some prevention research has and is conducted using informed consent with students responding to items addressing time of first use and frequency or intensity of different substance use as well as collecting physical samples such as saliva tests to determine the presence of tobacco by-products in the youths' systems to promote and determine the accuracy of the self-reporting of drug use. These are obviously more rigorous research designs enhancing the ability of the researcher to make judgments of changes in substance behaviors. It is the judgement of this researcher that young peoples' responses to items regarding their likelihood or intentions to experiment or use ATOD in the near future can also be used--perhaps in a less threatening way--to group respondents and examine changes in intentions to use and/or current use of tobacco, alcohol and marijuana.

Responses to three survey items that asked students to indicate their level of agreement, with statements about their personal decisions to not engage in tobacco, alcohol or marijuana use within the next 12 months, were used to estimate students' substance use status. Item scores were dichotomized to create categories of students less likely to be engaging in ATOD behaviors from students who were more likely or engaging in one or more of the ATOD behaviors. Students who felt strongly about their decision to not use tobacco, alcohol or marijuana, at the time of the pretest, were coded as "nonusers." Students who were less certain of their intentions to not engage in ATOD behaviors were coded as "potential users." The nonuser-potential user categories were computed to parallel other researchers' examination of prevention program treatment effects on youths who reported not using tobacco, alcohol or marijuana.

prior to program implementation and youths' reported ATOD behaviors after program implementation (Ellickson & Bell, 1990; Botvin et al., 1990; Botvin, 1980). Students' reported intentions to use substances at the posttest and the 20-week follow-up were examined for students identified as not using tobacco, alcohol and marijuana at the time of the pretest.

Intentions for Tobacco Use. The findings suggest that only eight percent (48 out of 588) of the students in the treatment condition indicated greater likelihood or actual tobacco use at the end of program delivery in comparison to 12% (45 out of 375) of the students in the control group ( $X^2 = 3.87, p = .04$ ). In other words, following the delivery of the TGFD II program, student smoking initiation or intentions were reduced by 33% for the treatment group relative to students in the control group. Examination of levels of intentions to use tobacco at the 20-week follow-up suggests that 14% (71 out of 510) of the students in the treatment group were more likely to use tobacco in comparison to 18% (55 out of 306) of the students in the control group ( $X^2 = 2.41, p = .12$ ). Although 22% fewer students in the treatment group indicated potential or actual tobacco use relative to students in the control group, these differences were not statistically significant.

Intentions for Drinking. Ten percent (59 out of 575) of the students in the treatment condition indicated greater likelihood or actual alcohol use at the end of program delivery in comparison to 16% (58 out of 366) of the students in the control group ( $X^2 = 6.41, p = .02$ ). In other words, following the delivery of the TGFD II program, student drinking initiation or intentions were reduced by 38% for the treatment group relative to students in the control group. Examination of levels of intentions to drink alcohol at the 20-week follow-up suggests that 18% (90 out of 495) of the students in the treatment group were more likely to use alcohol in the comparison to 21% (62 out of 298) of the students in the control group ( $X^2 = .83, p = .36$ ). Although approximately 14% fewer students in the treatment group indicated potential or actual alcohol use, these differences were not statistically significant.

Intention for Marijuana. Nine percent (50 out of 589) of the students in the treatment condition indicated greater likelihood or actual marijuana use at the end of program delivery in comparison to 12% (45 out of 384) of the students in the control group ( $X^2 = 2.75, p = .10$ ). Although approximately 25% fewer students in the treatment group indicated

potential or actual marijuana use, these differences were not statistically significant. Examination of levels of intentions to use to marijuana at the 20-week follow-up suggests that 12% (62 out of 510) of the students in the treatment group were more likely to use marijuana in comparison to 17% (54 out of 319) of the students in the control group ( $X^2 = 3.71$ ,  $p = .05$ ). The findings suggest that roughly 30% fewer students in the treatment group indicated potential or actual tobacco use 20 weeks following the delivery of the TGFD II program.

### Impact on Risk and Protective Factors.

The mean item score, for each of the six risk and protective subscales, was examined using a MANCOVA repeated measures design Posttest and the 20-week follow-up scores were adjusted using pretest scores as the covariate<sup>1</sup>. Observed and adjusted risk and protective scores, by treatment condition and time of survey administration, are provided in Table 2. A significant multivariate between subject effect was observed for the Treatment condition. Significant multivariates within subject effects were also observed Time x Treatment.

Shown in Table 3 are the results of the follow-up univariate analyses of covariance conducted to identify which of the six risk and protective factors were contributing to differences between the treatment and control condition as well as differences between the conditions over time (posttest and 20-week follow-up). The results of the post hoc analyses suggest students in the treatment group evidenced, in comparison to students in the control group, significantly higher scores on the posttest in each of the six risk and protective areas. Students participating in the TGFD II program evidenced more positive scores in their: (a) skills to resist peer pressures; (b) attitudes towards drug use; and (c) awareness of peer norms and use; (d) peers being less accepting of substance use; and (e) friendships formed with other young people less likely to engage in substance use.

The benefits of the TGFD II program for students continued to be evidenced at the 20-week follow-up in four of the six risk and protective areas. Students participating in the program continued to hold more positive perceptions or attitudes in the areas of resistance skills, awareness of peer drug norms, peer disapproval of substance use, and personal locus of control.

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<sup>1</sup>The data was analyzed using schools as the statistical unit of analysis. Scores were aggregated across students within schools and the school means for protective and risk scale scores subjected to MANCOVA/ANCOVA procedures resulting in similar findings. Overall Between Group Effects: Treatment ( $F = 13.89, p = .03$ ) and Pretest ( $F = 19.41, p = .02$ ); Within Group Effects adjusted using Hunh-Feldt: Time ( $F = 11.67, p = .0013$ ); Time x Treatment ( $F = 1.789, p = .115$ ); Time x Pretest ( $F = 8.89, p = .001$ ).

Table 2. Multivariate Analysis of Covariance and Univariate Analysis of Covariance on Substance Risk and Protective Scale Scores by Treatment Condition

<i>Effect</i>	<i>Wilks'Λ</i>	<i>df</i>	<i>F</i>	<i>p</i>
<b>Multivariate Between Effects</b>				
Treatment	.889	12, 1046	10.81	.0001
Covariate (Pretest)	.605	12, 1046	56.99	.0001
<b>Multivariate Within Effects</b>				
Time	.728	11, 1047	35.52	.0001
Time x Treatment	.951	11, 1047	4.90	.0001
Time x Covariate	.833	11, 1047	19.03	.0001

Univariate *F* tests Adjusted for Pretest Scores for Treatment Effects by Time

Posttest (Time 2)

Resistance Skills	1, 1057	32.23	.0001
Attitude Towards Use	1, 1057	12.15	.0005
Perceived Peer Norms	1, 1057	66.32	.0001
Peer Approval of Use	1, 1057	18.57	.0001
Prosocial Peer Group	1, 1057	12.67	.0004
Locus of Control	1, 1057	31.18	.0001

20-Week Follow-Up Test (Time 3)

Resistance Skills	1,1057	19.41	.0001
Attitude Towards Use	1,1057	3.43	.0644 <sup>a</sup>
Perceived Peer Norms	1,1057	51.21	.0001
Peer Approval of Use	1,1057	14.61	.0001
Prosocial Peer Group	1,1057	3.01	.0829 <sup>a</sup>
Locus of Control	1,1057	8.78	.0031

a=exceeds Bonferroni type adjustment for experiment-wise Type I error.

Towards the end of the school year, treatment and control students tended to hold similar levels of attitudes towards drug use, and similar levels of friendships with peers who may use tobacco, alcohol or marijuana. It should be noted that these two subscales, for both groups, were the highest or most positive of the six risk and protective areas at the time of the pretest, posttest and 20-week follow up--ranging from 4.82 to 4.56 on a five-point scale. The slight degrading of benefits over time to sixth graders' attitudes towards drug use and peer associations is a familiar phenomenon (Botvin et al., 1990; Ellickson & Bell, 1990) and reinforces the importance of ongoing prevention curricula or booster sessions throughout young people's school-life as maturation and negative peer influences add to the challenge of strengthening adolescents' protective attributes and decreasing their risk factors.

Table 3. Observed and Adjusted Substance Risk and Protective Scale Scores by Treatment Condition and Time

<u>Protective Scale</u>	<u>Time</u>	<u>Treatment</u>				<u>Control</u>			
		<u>Observed</u>	<u>Adjusted</u>	<u>Observed</u>	<u>Adjusted</u>	<u>Observed</u>	<u>Adjusted</u>	<u>Observed</u>	<u>Adjusted</u>
		M	SD	M	SE	M	SD	M	SE
Resistance Skills	Posttest	4.52	.453	4.50	.028	4.20	.784	4.25	.034
	Follow up	4.39	.752	4.36	.030	4.12	.822	4.15	.037
Attitudes Towards Use	Posttest	4.83	.453	4.82	.021	4.68	.662	4.69	.026
	Follow up	4.66	.712	4.65	.029	4.53	.776	4.56	.036
Perceived Peer Norms	Posttest	3.94	1.01	3.89	.036	3.34	1.02	3.42	.045
	Follow up	3.77	.104	3.72	.036	3.23	1.02	3.30	.045
Peers Disapprove Use	Posttest	3.84	1.04	3.79	.037	3.45	1.07	3.53	.047
	Follow up	3.76	.984	3.73	.037	3.43	1.07	3.47	.046
Prosocial Peers	Posttest	4.73	.558	4.71	.030	4.55	.718	4.58	.030
	Follow up	4.60	.735	4.58	.030	4.47	.864	4.50	.038
Locus of Control	Posttest	4.49	.705	4.47	.023	4.23	.571	4.26	.029
	Follow up	4.40	.632	4.37	.025	4.22	.721	4.25	.031

Note: M = Mean; SD = Standard Deviation; SE = Standard Error of the Measure.

## Summary and Conclusions

In consideration of the fact that school-based drug prevention programs are a piece of the broad spectrum of prevention/intervention strategies--their usefulness or contribution to healthy growth and decision-making on the part of young people--is highly dependent on the integrity, potency and commitment in which it is delivered and maintained. Prevention research shows a direct relationship between the efficacy of program implementation and the program's potential to impact participants (Botvin, et al., 1990; Botvin, Dusenbury, James-Ortiz, Kerner, 1989). In this study, classroom teachers' responses to items on a survey questionnaire suggest the TGFD II program was implemented as planned with a high degree of quality and fidelity to curriculum content and learning activities.

Prior to delivery of the TGFD II program, students in the treatment and control schools indicated similar levels of intentions to use/not use tobacco, alcohol or marijuana within the next 12 months. When sixth grade students were asked, at the beginning of the school year, how strongly they agreed or disagreed with statements about their decision to not use substances: 93.83% of the students indicated strong agreement or agreement with the statement that they did not plan to use tobacco; 81.87% indicated they did not plan to use alcohol; and 93.72% indicated they did not intend to use marijuana.

Following program delivery and again 20 weeks later, items' responses for students--who indicated at the beginning of the school year that they were not using substances or did not plan to use substances--were reexamined. Student responses suggest the following:

- (a) After program delivery, smoking initiation, use or intention was reduced by 33% for students participating in the TGFD II program in comparison to students in the control group. Positive effects continued to be observed 20 weeks after program delivery, with 22% fewer TGFD II students indicating undesirable changes in their intentions to use tobacco in comparison to students in the control group.
- (b) After program delivery, drinking initiation, use or intention was reduced by 38% for students participating in the TGFD II



program in comparison to students in the control group. Positive effects continued to be observed 20 weeks after program delivery, with 14% fewer TGFD II students indicating undesirable changes in their intentions to use alcohol in comparison to students in the control group.

- (c) After program delivery, marijuana initiation, use or intention was reduced by 25% for students participating in the TGFD II program in comparison to students in the control group. Positive effects continued to be observed 20 weeks after program delivery, with 30% fewer TGFD II students indicating undesirable changes in their intentions to use marijuana in comparison to students in the control group.

Prevention research has identified certain risk factors that increase the likelihood that a student will use drugs and certain protective factors that decrease or buffer the impact of the risk factors (Hawkins, Catalano, and Miller, 1992; Werner and Smith, 1992; Benson, 1997). The TGFD II program incorporates curriculum and instructional activities aimed at reducing risk factors and building protective factors. Student responses to risk and protective survey items at the end of program and again at 20-week follow-up suggest the following:

- (a) Students participating in the TGFD II program had statistically significant higher scores or more positive perceptions of their peer resistance skills in comparison to students in the control group (9-week and 20-week testing).
- (b) Students participating in the TGFD II program had statistically significant higher scores or more appropriate attitudes regarding the unacceptableness of young people's tobacco, alcohol or marijuana use in comparison to students in the control group (9-week and 20-week testing).
- (c) Students participating in the TGFD II program had statistically significant higher scores or were more knowledgeable/aware of actual rates of substance use among youth in their age group (peer norms) in comparison to students in the control group (9-week and 20-week testing).

- (d) Students participating in the TGFD II program had statistically significant higher scores or thought their peer group was less accepting of tobacco, alcohol or marijuana use in comparison to students in the control group (9-week and 20-week testing).
- (e) Students participating in the TGFD II program had statistically significant higher scores or formed friendships with peers who were less likely to engage in substance use behaviors in comparison to students in the control group (9-week testing).
- (f) Students participating in the TGFD II program had statistically significant higher scores or higher levels of locus of control/self-efficacy in the control group (9-week and 20-week testing).

In summary, the TGFD II program evidenced positive effects on sixth grade students' intentions to use tobacco, alcohol and marijuana. The program was also successful in impacting students' risk and protective factors associated with strengthening young people's abilities to make positive, healthy decisions. The impact of the TGFD II program on students' intentions, perceptions and attitudes was similar to effects observed with other "science-based" school-based prevention programs noted in the literature (Botvin et al., 1990; Ellickson & Bell, 1990).

TGFD II program's strengths as well as its challenges are mirrored in other "proven" prevention programs' research. Those challenges include, primarily, the tendency for some substance use behaviors and risk and protective factors to degrade or lessen over time, in combination with adolescents' maturational process including peer pressure and tolerance for risk-taking behaviors (Murray, Davis-Hearn, Goldman, Pirie and Luepker, 1988; Flay, et al., 1989). It is a reminder to educators that prevention curriculum cannot be a one-shot deal, but must be an ongoing process within and across school years (Shope, et al., 1990; Sigelman, 1992; Botvin, et al., 1995). It is also a reminder that schools and educators cannot, in isolation, help young people with the challenges they face but must collaborate and coordinate with the whole community of prevention and intervention efforts offered by other agencies, institutions, neighborhoods and families.

Interpretation of the finding of this study are limited as they are in most social science studies. Although the sample used in this study represented a broad diversity of students including ethnicity, location and socioeconomic status, only students in the sixth grade were examined. Therefore, generalizing program impact for students at other grade levels should be used with caution.

Another consideration in this study is the TGFD II program being delivered by trained instructors rather than classroom teachers. However, research findings suggest that formal instructors, classroom teachers, peer leaders, and other combinations of program delivery can facilitate similar positive results, provided the curriculum is delivered as planned (Botvin, et al., 1990; Ellickson & Bell, 1990).

Also evidenced in this study, as in almost all other prevention studies, is the loss of participant information over time. Examination of student attrition from the time of the posttest to the 20-week follow-up did not suggest any bias towards differential response rates for students that were more or less likely to be using tobacco, alcohol or marijuana. Differential rates of student attrition have, however, been noted in other studies, particularly with older youth where substance use is more prevalent.

Future research efforts may be directed at examining: the long-term impact of booster sessions offered in Grades 7 and 8 on students participating in the current study or similar longitudinal study; examining the impact of the TGFD II prevention program on students at different grade levels by correlating the curriculum with appropriate risk and protective factors; and exploring the impact of the TGFD II program on students when the program is delivered using trained and untrained classroom teachers.

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