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Effectiveness of Culturally Focused and Generic Skills Training Approaches to Alcohol and Drug Abuse Prevention Among Minority Adolescents: Two-Year Follow-Up Results

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Two-year follow-up data (from inner-city, minority adolescents) were collected to test the effectiveness of 2 skills-based substance abuse prevention programs and were compared both with a control condition and with each other. Students were originally recruited from 6 New York City public schools while in 7th grade. Schools were matched and assigned to receive a generic skills training prevention approach, a culturally focused prevention approach, or an information-only control. Students in both prevention approaches had less current alcohol use and had lower intentions to engage in future alcohol use relative to students in the control group. Students in the culturally focused group also engaged less in current alcohol behavior and had lower intentions to drink beer or wine than those in the generic skills group. Both prevention programs influenced several mediating variables in a direction consistent with nondrug use, and these variables also mediated alcohol use.

Recent national survey data (Johnston, O'Malley, & Bachman, 1994) showed that substance use is once again on the increase, further underscoring the importance of developing effective prevention approaches. Literature reviews (Botvin, 1986; Flay, 1985; Goodstadt, 1986; Hansen, 1992) and meta-analytic studies (Bangert-Drowns, 1988; Bruvold & Rundall, 1988; Tobler, 1986) have consistently pointed to the superiority of prevention approaches that focus on the psychosocial factors believed to promote and sustain drug use over more traditional information-dissemination approaches. Psychosocial approaches to drug abuse prevention are based on social learning theory (Bandura, 1977), communications theory (McGuire, 1964), and problem behavior theory (Jessor & Jessor, 1977). From this perspective, drug use initiation is viewed as a consequence of the interplay of interpersonal and intrapersonal factors. Drug use is conceptualized as a behavior that is learned through a process of modeling and reinforcement from various social influences, including peers, family members, and the media. Vulnerability to these influences is determined by domain-specific cognitions, attitudes, and expectations as well as the availability of skills for coping with drug use offers and other life situations confronting adolescents. Most of the prevention approaches that are based on this model emphasize (a) increasing students' awareness of the social influences promoting drug use, (b) modifying normative expectations concerning drug use, (c) teaching skills for resisting drug use

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pressures (e.g., Pentz et al., 1989), and (d) the teaching of more general personal and interpersonal skills (e.g., Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990) in an effort to decrease motivations to use drugs and to increase awareness of the social influences to use them.

Despite progress in developing effective approaches to drug abuse prevention over the past decade, relatively little is known concerning the etiology and prevention of drug abuse among minority populations. Moreover, much of the evidence supporting the effectiveness of psychosocial approaches to drug abuse prevention derives from short-term studies that focus on cigarette smoking. Additional research is clearly necessary to identify prevention approaches that are effective with inner-city minority adolescents, focus on substances other than cigarette smoking, and include longer term follow-up data.

In our own work, a psychosocial prevention approach, including the teaching of social resistance skills within the context of a broader intervention designed to teach general personal and interpersonal skills, has been found to be effective for preventing tobacco, alcohol, and marijuana use when targeting White, middle-class adolescents (e.g., Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990) and for preventing cigarette smoking when targeting African American adolescents (Botvin, Batson, et al., 1989) and Latino adolescents (Botvin, Dusenbury, et al., 1989; Botvin et al., 1992). Although the research conducted thus far with cigarette smoking suggests that this prevention approach generalizes well to different populations, additional research is necessary to determine its effectiveness for reducing alcohol and drug use with inner-city, minority adolescents and to identify the mechanisms through which prevention effects are produced.

To the extent that inner-city, minority adolescents have different needs and learning styles, it might be argued that an intervention approach that is culturally focused would be more effective in preventing alcohol and drug use than a more generic program. Latino and African American adolescents appear to prefer an active learning style that is conducted in a student-centered environment with group projects, discussions, and role-plays (Hale-Benson, 1982). Research also suggests that interventions targeting minority adolescents should include materials to enhance ethnic pride (Schinke, Botvin, Orlandi, Schilling, & Gordon, 1990) and foster cultural identity and tolerance for other cultures (Felix-Ortiz & Newcomb, 1995). Focus group data from African American and Latino adolescents highlight the importance of including audiovisual presentations that use scenes and language familiar to minority adolescents (Schinke, Orlandi, Schilling, & Parms, 1992).

Moreover, the effectiveness of preventive interventions with minority adolescents may be enhanced by including narrative or storytelling methods along with video demonstrations, group discussions, and role-playing. This combination of techniques serves to combat the stressors and environmental constraints inherent in an impoverished inner-city environment (Bruner, 1975). According to social learning theory (Bandura, 1986), observational learning can be enhanced by multiple delivery methods because there is a greater impact on the attentional, retentional, production, and motivational processes involved. Furthermore, narrative psychology assumes that people think, perceive, imagine, and make moral choices on the basis of narrative structures. Therefore, a narrative or story may be viewed as an organizing principle for behavior (Coles, 1989; Howard, 1991; Sarbin, 1986; Vitz, 1990). Previous research with minority adolescents points to the potential of modeling prevention skills by using a folk hero within a storytelling framework (Costantino, Malgady, & Rogler, 1986, 1988). Comparison of a culturally focused prevention approach to a more generic approach would address whether a culturally focused intervention is more effective and would be an important contribution to the literature.

In summary, a number of important issues have only received limited attention and, thus, warrant further research. First, most drug abuse prevention studies have been conducted with White, middle-class, suburban populations; little is known about the effectiveness of these or other prevention approaches with inner-city, ethnic-minority populations or the extent to which programs need to be tailored to the target population to be effective. Second, most published studies have focused on cigarette smoking; relatively little research has examined the effectiveness of these approaches on the use of alcohol and other drugs. Third, studies testing the effectiveness of these

prevention approaches with minority adolescents have generally only provided short-term data; longer term follow-up data are needed to access the durability of any observed prevention effects. Fourth, no one has compared a culturally focused prevention program with a generic skills prevention program. Finally, little is known about the mediating mechanisms of effective prevention approaches.

This study was designed to address these gaps in the literature by providing 2-year follow-up data for a previously conducted study in which culturally focused and generic skills training approaches to alcohol and drug abuse prevention with inner-city, ethnic-minority adolescents were studied (Botvin, Schinke, Epstein, & Diaz, 1994). In the initial study we found significant prevention effects at the end of the seventh grade for both approaches with respect to behavioral intentions to drink beer or wine, drink liquor, or use drugs in the future. It was hypothesized that at the 2-year follow-up (end of the ninth grade), prevention effects for behavioral intentions would be maintained and that prevention effects for alcohol and drug use behavior would emerge for both approaches. Furthermore, we expected that the culturally focused intervention might prove more effective than the generic skills intervention. Finally, hypothesized mediating variables were assessed both to determine the extent to which the preventive interventions produced an impact on them and to identify potential mediational mechanisms.

Method

Overview

Six participating junior and intermediate high schools were matched according to demographics and were assigned to one of the three study conditions: (a) generic skills training, (b) culturally focused intervention, or (c) information-only control. Once schools agreed to participate, every seventh-grade classroom within each school took part in the intervention. Informed and consenting seventh-grade students participated in pretest measurements. During the seventh grade, students received one of the three interventions. The following year in eighth grade, students received booster sessions. The measurements were repeated again 2 years later when the students were in the ninth grade.

Sample

We conducted this study in six New York City Public Schools that met the recruitment criteria of having more than 85% minority student bodies (range from 88% to 100%). A total of 757 seventh-grade students participated in the pretest. Of the students who participated in the pretest, 456 (60%) provided data at both the pretest and the ninth-grade data collection. The mean age of the students in ninth grade was 14.96 years. The merged pretest and 2-year follow-up sample comprised 53% girls and 47% boys and 49% African American, 37% Latino, 5% White, 3% Asian, and 7% other. Thirty-six percent of the students lived with both parents, 42% lived with their mother only, 10% lived with their mother and stepfather, 2% lived with their father and stepmother, 1% lived with their father only, and 10% were not living with either parent. On the basis of the data provided by the New York City Board of Education, the students in the schools participating in this study were categorized as below the poverty level. At the pretest, only 4% of the sample drank alcohol once a month or more (current drinkers), and 3% had tried marijuana (experimental marijuana users). The proportions of current users of alcohol and experimental marijuana users were comparable across conditions.

Follow-Up Tracking

An aggressive attempt was made to include as many of the 757 students who participated in the seventh grade as possible for the 2-year follow-up in ninth grade. Students received a free movie ticket as an incentive for participation in the study in ninth grade. Only one of the six participating schools had ninth graders; students from the remaining five schools dispersed to over 50 high schools. Overall, 339 questionnaires were completed in the schools: 88 (75%) of the students who remained in the same school and 251 (48%) who moved to a high school. Follow-up data were collected from another 117 students by mail or by interview.

Procedure

All students in the study completed a pretest questionnaire that measured self-reports of cur-

rent substance use (alcohol and marijuana use) and behavioral intentions for substance use (beer or wine, liquor, marijuana, cocaine, and other drugs) as well as cognitive, attitudinal, and individual difference variables hypothesized to be related to the initiation of substance use. Students were assured about the confidentiality of their responses. Identification codes were utilized rather than names to emphasize the confidential nature of the survey. They were assured that no one would know how they answered these questions. The questionnaire was completed during a regular 40-min classroom period; it was administered in class by a team of three to five data collectors who were members of the same minority groups as the students. To enhance the validity of self-report data, we collected carbon monoxide breath samples by utilizing a variant of the procedure described by Evans, Hansen, and Mittlemark (1977). Although the collection of carbon monoxide samples is most directly related to cigarette smoking, prior research suggests that similar procedures that focus on cigarette smoking can also enhance the validity of adolescents' self-reports of alcohol and marijuana (E. Botvin, G. J. Botvin, Renick, Filazzola, & Allegrante, 1984). Subsequently, students in the two experimental conditions (generic skills and culturally focused interventions) participated in their respective 15-session curriculums taught at an average rate of two sessions per week. Booster sessions were included in the eighth grade. Approximately 2 years after the pretest, students completed the same questionnaire, and carbon monoxide samples were collected again.

Prevention Programs

The main purpose of the generic skills intervention (GSI) and the culturally focused intervention (CFI) is to facilitate the development of personal and social skills, with particular emphasis on the development of skills for coping with social influences to drink alcohol or to use drugs. Both interventions teach students cognitive–behavioral skills for problem solving and decision making, building self-esteem, resisting peer pressure, managing stress and anxiety, communicating effectively, and developing positive personal relationships. In addition, the GSI teaches knowledge related to alcohol and drugs and contains material designed to modify normative expectations. The GSI approach was initially designed and tested on White, middle-class adolescents; whereas the CFI approach was specifically designed for inner-city minority students. GSI utilizes a combination of teaching techniques that includes demonstration, behavioral rehearsal, feedback, and reinforcement. The focused curriculum utilizes multicultural mythic and contemporary stories in teaching the skills through the mediums of live storytelling, video, and peer leaders. The myths are from ancient Greek, African, and Spanish culture; the contemporary stories represent inner-city culture. Each story models the different skills through the use of characters and context that are representative of the particular culture and includes a main character who gradually overcomes obstacles and achieves goals by using the various skills. Both prevention programs are described in greater detail elsewhere (Botvin et al., 1994). Outside intervention providers, of the same ethnic background as the students, were hired to deliver the interventions. Qualifications and training for intervention providers were equivalent across conditions. Peer leaders were selected by the school systems involved; participation was voluntary.

Information-Only Control

Prior prevention studies have generally used no-contact or placebo control groups. Moreover, some evidence suggests that psychosocial prevention approaches are effective because they correct normative expectations (Botvin et al., 1992). To conduct a more rigorous test of the two prevention approaches and to identify potential mediating mechanisms other than increasing knowledge or modifying perceived norms, we provided control schools with an intervention that was designed to change drug-related knowledge and norms. Students in the information-only control (IC) condition received a 5-session curriculum. In those lessons, students were exposed to information about drug use and its consequences and were provided with information concerning actual prevalence rates among adults and adolescents. However, these students did not receive any skills training.

Booster Sessions

During the eighth grade, students received booster sessions. The booster sessions were

designed to review and to reinforce the material covered during the seventh grade. As in the first year, the booster sessions in the GSI and CFI groups focused on skills that enable students to deal more effectively with the social influences that encourage them to drink alcohol or to use drugs. The GSI and CFI boosters lasted eight sessions, and the IC was three sessions long.

Measures

A 149-item self-report questionnaire was administered to the students at pretest in seventh grade before the intervention and again 2 years later. The questionnaire assessed current substance use and intentions for substance use in the future. The questionnaire items measured cognitive, attitudinal, skills, and psychological variables believed to foster the initiation of substance use. Although all measures were self-reported, assurance of confidentiality tends to minimize problems related to validity. In addition, correlations between the substance use measures and related measures (e.g., friends' substance use) were high, suggesting construct validity. As for the issue of social desirability of responses to substance use measures, because all three conditions received some form of alcohol and drug use prevention program, social desirability should be similar across conditions. The questionnaire also included demographic items and measures concerning the perceived prevalence of substance use by adults and peers. The measures are described in greater detail in our earlier work with these adolescents in the seventh grade (Botvin et al., 1994) but are summarized below, and where appropriate internal reliability estimates (Cronbach's alpha) for the 2-year follow-up measures are presented in parentheses.

Alcohol and drug use measures. The frequency of drinking alcoholic beverages, getting drunk, and using marijuana were measured on scales ranging from 1 to 9, with 9 representing the most frequent use. The amount of alcohol consumed per drinking occasion was assessed on a scale ranging from 1 to 6, with 6 being the highest amount. Intentions for substance use (beer or wine, hard liquor, marijuana or hashish, cocaine–crack, or other drugs) within the next year were each rated on 5-point scales anchored by 1 (*definitely not*) and 5 (*definitely will*). Because almost all of the students indicated that they definitely would not use cocaine or other drugs, these scales were not included in the analyses.

Hypothesized mediating measures. True–false scales (which when combined were converted to 0–100 scales) were used to assess knowledge about the immediate and short-term consequences, prevalence, and social acceptability of alcohol and marijuana use (Botvin, Baker, Renick, Filazzola, & Botvin, 1984). Students indicated their attitudes about the use of (a) alcohol ($\alpha = .85$), (b) marijuana ($\alpha = .87$), and (c) cocaine and other drugs ($\alpha = .91$; U.S. Public Health Service, 1974), which when combined were converted to 0–100 scales. They also indicated their normative beliefs concerning the prevalence of these substances among adults and peers on 5-point scales anchored by 1 (*none*) and 5 (*all or almost all*).

A decision-making scale ($\alpha = .87$) was derived from the Coping Inventory (Wills, 1986). Refusal assertiveness was assessed by using four refusal skill items ($\alpha = .82$; Gambrill & Richey, 1975). Respondents' confidence about their ability to use specific personal and social skills (life skills) was measured. Several measures assessed general psychological characteristics or tendencies: risk taking ($\alpha = .84$; Eysenck & Eysenck, 1975), self-esteem ($\alpha = .77$; Rosenberg, 1965), and self-efficacy (Paulhus, 1983). All of these scales were also converted to 0–100.

Results

Overview

Only individuals providing data at both the pretest and the 2-year follow-up were included in the analyses reported in this article (merged pretest and 2-year follow-up sample). Because there was little variability for the intention to use cocaine and the intention to use other drugs, these variables were not analyzed. First, the pretest comparability of the three conditions (GSI, CFI, and IC) for the demographic variables and the major dependent variables was determined. Second, the sample used in this study was examined to determine the impact of attrition. Third, the effectiveness of the prevention programs was tested by using a series of multiple regressions that included the pretest variables, a contrast comparing each of the prevention programs (+1) with the IC condition (−2) and a contrast com-

paring the CFI program (+1) to the GSI program (−1). Multiple regressions were chosen because analysis of variance (ANOVA) procedures can only provide a limited test of mediational hypotheses (Fiske, Kenny, & Taylor, 1982). Finally, following procedures suggested by Judd and Kenny (1981a, 1981b), we used regression analyses to determine the extent to which alcohol and drug use and behavioral intention effects were mediated by attitudinal and individual difference variables.

Pretest Equivalence

First, with a series of cross-tabulations, we tested the pretest equivalence of the demographic variables by condition. There were no significant differences between conditions for gender, father's education, mother's education, or academic performance. There were differences between conditions that were based on ethnicity and race, with a greater proportion of Latino students and a lower proportion of African American students in the IC condition (51% Latino and 19% African American) than in the GSI (35% Latino and 54% African American) and CFI (31% Latino and 61% African American) groups. Family structure also differed by condition, with a greater proportion of students in the IC condition reporting that they lived with both their mother and their father (61%) compared with the GSI (33%) and CFI (23%) groups. Both of these findings make for a more conservative test of the interventions because drug use tends to be lower among African American adolescents and in two-parent families.

A series of ANOVAs were then conducted to determine the pretest comparability of the three conditions (GSI, CFI, and IC) for the major dependent variables, followed by planned comparisons. These analyses indicated that comparability was achieved on the marijuana variables. Although the ratings of intention to drink liquor differed between the GSI ($M = 1.06$) and CFI ($M = 1.19$) condition, $t(438) = 2.15$, $p < .05$, neither differed from the IC group. Qn the alcohol use measures, the CFI group significantly differed from the IC condition. Specifically, drinking frequency was higher in the CFI ($M = 1.77$) than in the IC group ($M = 1.34$), $t(448) = 3.39$, $p < .001$. Amount consumed was greater in the CFI ($M = 1.62$) than in the IC condition ($M = 1.22$), $t(446) = 3.54$, $p < .001$. Frequency of drunkenness was also higher in the CFI ($M = 1.35$) than in the IC condition ($M = 1.17$), $t(449) = 2.07$, $p < .05$. The GSI group ($M = 1.57$) differed from the IC group ($M = 1.34$) on drinking frequency, $t(448) = 2.30$, $p < .05$. The IC group means were all lower than the other interventions, thus making for a more conservative test of the GSI and CFI groups compared with the IC condition. However, we did control for the substance use differences between conditions by including pretest substance use as a covariate in the subsequent regression analyses.

Attrition Analyses

Analyses were done to determine the extent to which any potential bias resulting from differential attrition might have been introduced into the study. Two-way ANOVAs (Pretest Use Status × Condition) were conducted by using current use of alcohol and marijuana and condition as independent variables with retention rate as the dependent variable. Preplanned contrasts comparing the GSI and CFI groups with the IC condition were also calculated; no significant attrition effects were found by pretest drinking status. In the analysis of pretreatment marijuana users, there was higher attrition in the IC condition (39%) than in the GSI condition (34%), $F(1, 738) = 4.31$, $p < .05$. Two nearly significant Pretest Use Status × Condition interactions were found with greater attrition among the pretest marijuana users in the IC condition (78%) than in the GSI group (29%), $F(1, 738) = 3.51$, $p = .06$, and in the CFI (50%), $F(1, 738) = 3.35$, $p = .07$. It should be noted that the number of pretreatment marijuana users was very low. These analyses indicated that there were no differential attrition effects in terms of pretest drinking status and a modest effect toward differential attrition for pretest marijuana use status favoring the IC group.

Evaluation

These results were derived from the merged pretest and 2-year follow-up sample. The three conditions evaluated were (a) a broad spectrum GSI, (b) a CFI, and (c) an IC group that was only provided with factual information. These three conditions were compared at posttest by using two

contrasts in a series of multiple regressions, with the pretest value for each variable simultaneously included to control for any pretest differences as warranted by the pretest comparability analyses reported earlier and on the basis of past research. Furthermore, when using regression analyses for structural modeling, theory specifies the important variables, and one only needs a single regression equation (Kenny, 1979). Following the guidelines for contrast coding (Cohen & Cohen, 1983), we computed two orthogonal contrasts to compare the CFI (+1) and GSI (+1) groups with the IC (−2) and the CFI (+1) with the GSI (−1). These contrasts were selected to test the main study hypotheses of interest of whether the prevention approaches were more effective than the information control and whether the culturally focused program was more effective than the generic skills program. Although the method of data collection (in school vs. not in school) was not expected to be related to alcohol or drug use, we tested it in the regression models of current use. The interaction between method and the two condition contrasts was also calculated. Because neither the main effect of method nor the interaction between method and the two contrasts was significant in any of these analyses, they did not in fact need to be included in the model. One-tailed significance tests were used for the analyses of intervention effects as warranted by the hypothesized direction of effects and the results of previous research that used similar prevention approaches.

Current substance use. Table 1 shows the substance use means adjusted for Pretest Score × Condition for representative purposes only. The proportion of current alcohol users (once a month or more) in each condition also illustrates the prevention effects: 13% in IC, 10% in GSI, and 6% in CFI. The regression model for current alcohol use was significant, $F(3, 444) = 22.21, p < .0001$. Drinking frequency was significantly reduced by both the GSI and CFI conditions relative to the IC condition, $t(444) = -3.71, p < .0001$, $\beta = -.17$. Students in the CFI group drank less frequently than those in the GSI group, $t(444) = -2.79, p < .003, \beta = -.13$. The regression model for alcohol consumption was also significant, $F(3, 439) = 12.51, p < .0001$. Amount of alcohol consumed was lower for the CFI and GSI conditions relative to the IC condition, $t(439) = -2.46, p < .007, \beta = -.11$. Moreover, students in the CFI condition drank less alcohol than students in the GSI condition, $t(439) = -1.97, p < .03, \beta = -.09$. The regression model for frequency of drunkenness was significant, $F(3, 446) = 9.16$, $p < .0001$. Both interventions lowered frequency of drunkenness relative to the IC group, $t(446) = -3.58, p < .0002, \beta = -.17$. Students in the CFI group were drunk less often than those in the GSI group, $t(446) = -1.82, p < .04, \beta = -.08$. Neither contrast predicted marijuana use. The proportion of marijuana experimenters was similar across conditions (19% for IC, 18% for GSI, and 20% for CFI).

Table 1
Adjusted Follow-Up Means for Substance Use at Two-Year Follow-Up by Condition

Variable	GSI	CFI	IC
Current use			
Drinking frequency	1.94	1.61	2.25
Drinking amount	1.65	1.42	1.85
Drunkenness frequency	1.40	1.25	1.64
Marijuana frequency	1.33	1.42	1.36
Intention to use in next year			
Beer or wine	2.06	1.77	2.33
Liquor	1.32	1.25	1.56
Marijuana	1.34	1.27	1.35

Note. GSI = generic skills intervention; CFI = culturally focused intervention; IC = information-only control.

Behavioral intentions for substance use. In terms of intention measures, the regression model for the intention to drink beer or wine was significant, $F(3, 428) = 20.73, p < .0001$. Both interventions reduced intentions to drink beer or wine relative to controls, $t(428) = -2.98, p < .002, \beta = -.14$. Students in the CFI condition had lower intentions to drink beer or wine compared with the students in the GSI condition, $t(428) = -2.30, p < .01, \beta = -.11$. The overall regression model for intention to drink liquor was also significant, $F(3, 422) = 7.25, p < .0001$. Both the GSI and the CFI, $t(422) = -2.76, p < .003, \beta = -.13$, reduced intentions to drink liquor; however, the contrast comparing the GSI and CFI conditions was not significant. Neither intervention influenced intention to use marijuana.

Mediating variables. Table 2 presents the means for the potential mediating variables (knowledge, attitudes, normative expectations, skills, and personality) adjusted for the Pretest Score × Condition interaction for representative purposes only.

Table 2
Adjusted Follow-Up Means for Knowledge, Attitudes, Expectations, Skills, and Personality at Two-Year Follow-Up by Condition

Variable	GSI	CFI	IC
Knowledge			
Drinking	90.84	93.15	88.42
Marijuana	82.17	82.10	86.29
Substance use attitudes			
Antidrinking	89.51	88.74	85.52
Antimarijuana	91.59	89.01	88.04
Anticocaine and other drugs	95.41	93.59	93.14
Normative expectations			
Adult drinking	3.61	3.52	3.57
Peer drinking	3.18	3.00	3.25
Adult marijuana use	2.54	2.39	2.18
Peer marijuana use	2.88	2.87	2.61
Adult cocaine use	2.17	1.94	1.90
Peer cocaine use	1.62	1.57	1.68
Adult other drugs	2.03	1.87	1.83
Peer other drugs	1.57	1.57	1.62
Skills			
Refusal assertiveness	75.28	74.75	71.46
Decision making	76.84	74.02	76.82
Life skills	71.12	71.49	70.65
Personality measures			
Risk taking	34.52	29.62	41.15
Self-esteem	76.33	76.78	75.12
Efficacy	76.04	78.34	77.35

Note. GSI = generic skills intervention; CFI = culturally forcused intervention; IC = information-only control.

The overall regression model for marijuana knowledge was significant, $F(3, 386) = 6.49, p < .001$. Both the GSI and CFI conditions had significantly less knowledge about marijuana use than the IC condition, $t(386) = -1.88, p < .03$, $\beta = -.09$. The overall regression models for antidrinking attitudes, $F(3, 387) = 7.90, p < .0001$, was significant. Students in the GSI and CFI groups had higher antidrinking attitudes $t(387) = 1.84, p < .03, \beta = .09$, than the IC group.

Consistent with our expectation, the prevention groups did not significantly differ from the IC condition in terms of normative expectations related to alcohol use. However, the normative expectations for marijuana use among adults, $F(3, 424) = 13.80, p < .0001$; $t(424) = 1.88, p < .03$, $\beta = .09$, and among peers, $F(3, 429) = 16.74, p < .0001$; $t(429) = 1.80, p < .04, \beta = .08$, were significantly higher for the intervention groups than the IC group. This may be because there was higher attrition in the IC group than in the GSI group for marijuana users.

Among skill and individual difference variables, refusal assertiveness, $F(3, 431) = 4.93, p < .002$, and risk-taking tendency, $F(3, 364) = 35.68, p < .0001$, showed significant differences. Students in the intervention groups used refusal assertiveness skills more often, $t(431) = 1.60, p = .06, \beta = .08$, than students in the IC group. Both the GSI and the CFI groups, $t(364) = -3.38, p < .0004, \beta = -.16$, had significantly lower risk-taking scores than the IC group. Students in the CFI group had lower risk-taking scores than students in the GSI group, $t(364) = -1.94, p < .03, \beta = -.09$. None of the other skill or individual difference measures were affected by the interventions.

Testing Mediation Effects

Regression analyses were used to examine the effects of the prevention programs on the substance use variables and the mediating variables conducted by following the guidelines set by Judd and Kenny (1981a, 1981b). Regression analyses tested (a) whether the effects of the independent variables (the two contrasts) significantly predicted the outcome measures (the substance use variables), (b) whether the independent variables (the two contrasts) significantly affected the potential mediators (cognitive, attitudinal, normative, skills, and individual difference measures), and (c) whether the mediators significantly predicted the outcome measures (substance use variables) with the independent variables (two contrasts) controlled. As before, the regressions were conducted by using two contrasts that compared the prevention programs with the control condition and with each other. The substance use pretest variables were entered again to control for any pretest differences.

Thus far, the first two conditions have been satisfied, as the independent variables predicted the alcohol outcome measures and several mediators. If the last condition is also satisfied, and the effect of the independent variable is less in this equation than in the first (and the beta coefficient has decreased), then mediation has been demonstrated (Baron & Kenny, 1986). Perfect mediation refers to the case when the independent variable has no effect when the mediators are controlled.

Mediation analyses were conducted for the five drinking variables (frequency of drinking, drinking amount, frequency of drunkenness, intention to drink beer or wine, and intention to drink hard

liquor) that were significantly affected by the independent variables. The mediators tested were those that had significantly been affected by the independent variables and were relevant to the alcohol variables. In other words, although several mediators relevant to marijuana use were significant because the intervention did not affect the marijuana variables, further analyses relevant to marijuana use were not warranted. Antialcohol attitudes, refusal assertiveness, and risk taking were added to the models (contrasts comparing the prevention programs with the control condition and with each other, a pretest version of the dependent variable).

All three mediators significantly predicted frequency of drinking, $F(6, 414) = 34.62$, $p < .0001$. Higher antidrinking attitudes decreased the frequency of drinking, $t(414) = -4.33$, $p < .0001$, $\beta = -.19$. Similarly, more frequent use of refusal assertiveness skills lowered drinking frequency, $t(414) = -4.05$, $p < .0001$, $\beta = -.17$. Finally, the lower the risk-taking tendency, the lower was the frequency of drinking, $t(414) = 6.47$, $p < .0001$, $\beta = .28$. The contrast comparing GSI and CFI to IC had a lower level of significance ($p < .03$) and a lower coefficient ($\beta = -.08$); the contrast comparing GSI and CFI had a lower level of significance ($p < .01$) and a reduced coefficient ($\beta = -.10$) demonstrating mediation.

In the regression that tested mediation for amount of alcohol consumed, all three mediators were significant predictors, $F(6, 411) = 25.81$, $p < .0001$. The relationships were in the same direction as those for drinking frequency: Higher antidrinking attitudes, $t(411) = -2.97$, $p < .002$, $\beta = -.14$, and more frequent refusal assertiveness, $t(411) = -3.15$, $p < .008$, $\beta = -.14$, were related to less alcohol consumed; the lower the risk-taking tendency, the less alcohol consumed, $t(411) = 7.05$, $p < .0001$, $\beta = .32$. The contrast comparing the CFI and GSI conditions to the IC group was no longer significant ($p = .13$) and the beta decreased ($-.05$), showing that these variables perfectly mediated this effect. The contrast comparing the CFI and GSI groups had a lower significance level ($p < .04$) and beta ($-.08$) suggesting mediation.

Antidrinking attitudes, refusal assertiveness, and risk taking were all predictors of frequency of drunkenness, $F(6, 415) = 23.20$, $p < .0001$. Higher antidrinking attitudes, $t(415) = -1.98$, $p < .03$, $\beta = -.09$, and more frequent use of refusal assertiveness, $t(415) = -4.90$, $p < .0001$, $\beta = -.22$, were related to lower frequency of drunkenness, and lower risk-taking tendency meant less frequent drunkenness, $t(415) = 6.35$, $p < .0001$, $\beta = .29$. The contrast comparing CFI and GSI to the IC group had a lower level of significance ($p < .009$) and a reduced beta ($-.10$). The second contrast comparing the CFI group and GSI group was no longer significant ($p = .14$) and the beta decreased ($-.05$) showing that these variables perfectly mediated this effect.

The same three variables also predicted intention to drink beer or wine, $F(6, 400) = 35.98$, $p < .0001$, and intention to drink liquor, $F(6, 394) = 19.31$, $p < .0001$. Higher antidrinking attitudes decreased the intention to drink beer or wine, $t(400) = -4.63$, $p < .0001$, $\beta = -.21$, and the intention to drink liquor, $t(394) = -2.45$, $p < .007$, $\beta = -.12$. More frequent use of refusal assertiveness skills lowered the intention to drink beer or wine, $t(400) = -3.86$, $p < .0001$, $\beta = -.17$, and the intention to drink liquor, $t(394) = -5.14$, $p < .0001$, $\beta = -.24$. Lower risk-taking tendency decreased the intention to drink beer or wine, $t(400) = 7.09$, $p < .0001$, $\beta = .31$, and the intention to drink liquor, $t(394) = 4.26$, $p < .0001$, $\beta = .20$. The contrast comparing the prevention programs to the control group was no longer significant and had a lower coefficient in the beer or wine intention regression ($p = .22$, $\beta = -.03$) and in the liquor intention regression ($p = .07$, $\beta = -.07$), demonstrating that these three variables mediated this effect perfectly. The contrast comparing the CFI and GSI programs for the beer or wine intention regression had a lower level of significance ($p < .03$) and a reduced beta ($-.08$) showing mediation of this effect; it had not been significant in the earlier model for the liquor intention regression.

Discussion

The results of this study demonstrate the effectiveness of the two prevention approaches tested for predominantly (96%) minority adolescents attending school in New York City. Previously reported results from the initial posttest (Botvin et al., 1994) indicated that both the generic skills training approach and the culturally focused approach significantly decreased adolescents' intentions to drink beer or wine when compared with information-only controls. The

generic skills training approach also significantly decreased adolescents' intentions to drink liquor and to use illicit drugs in the future.

Follow-up results reported in this article show that 2 years after completion of the initial intervention, both prevention approaches significantly decreased adolescents' intentions to drink beer, wine, or liquor. Both prevention approaches also produced significant reductions (relative to controls) in how often adolescents drank alcohol and how often they got drunk. In addition, both prevention approaches produced reductions in the amount of alcohol adolescents drank per drinking occasion. The CFI also proved to be more effective than the GSI. Specifically, students in the CFI condition drank alcohol less often, consumed less alcohol per drinking occasion, were drunk less often, and had lower intentions to drink beer or wine than students in the GSI condition. Significant effects were also found for several hypothesized mediating variables: higher antidrinking attitudes (GSI and CFI vs. IC), higher refusal assertiveness (GSI and CFI vs. IC), and lower risk taking (GSI and CFI vs. IC; GSI vs. CFI). Effects on these hypothesized mediating variables were in the expected direction.

Research demonstrating the effectiveness of culturally appropriate interventions outside of the mental health field is scarce (Marin, 1993). Both of the interventions tested in this study were designed to be relevant and acceptable to the target population. The results of the present study are important because they are the first to demonstrate the effectiveness of school-based approaches to alcohol abuse prevention with inner-city minority adolescents and because prevention effects were present 2 years after the conclusion of the primary year of intervention. The results of this study are also noteworthy because the two prevention approaches were contrasted with a comparison group receiving an informational intervention rather than a "no-contact" control group as in most previous prevention studies (cf. Botvin & Botvin, 1992). Because past studies have shown that inclusion of this material modifies knowledge, attitudes, and norms about drugs (e.g., Botvin et al., 1990; Botvin et al., 1992) and that these effects have been associated with reduced substance use, this study should be viewed as a fairly conservative test of these prevention approaches.

Although the results of this study suggest that it may be possible to develop a preventive intervention that is effective with a relatively broad range of students, tailoring interventions to specific populations appeared to increase effectiveness. Specifically, a culturally focused intervention that incorporated techniques considered beneficial to minority youth (e.g., storytelling) was more effective than a more generic approach. However, additional research is needed to better understand this issue and to identify the features or elements of alcohol and drug abuse prevention approaches that can increase their efficacy with specific minority populations, particularly because our study was limited to only six schools and a relatively small number of students.

Previous prevention research suggests that correcting normative expectations may serve as a major mediating mechanism of prevention effects (Botvin et al., 1992). The results of the mediational analyses conducted in this study indicate that the prevention effects with respect to lower drinking frequency, consumption, and drunkenness were mediated to varying degrees by the impact of the prevention programs on attitudes, refusal assertiveness, and risk taking. These findings not only indicate the importance of these variables in preventing drinking behavior, but they also demonstrate that prevention effects can be produced without modifying normative expectations.

Two limitations that should be given consideration when interpreting the findings of this study concern the inclusion of two inner-city minority groups. First, these findings may not generalize to other racial–ethnic minority populations. Second, a focus on a single minority population might facilitate the implementation of a culturally focused intervention more than attempting to focus on two different populations, as was the case in this study, which included both African American and Latino adolescents.

The results of this study provide evidence of the effectiveness of two different prevention models that emphasize skills training for inner-city minority populations. Prevention effects appeared first at the initial posttest for behavioral intentions and at the 2-year follow-up for behavioral self-report data, underscoring the importance of additional follow-up assessment in prevention studies. The presence of prevention effects for hypothesized mediating variables, along with evidence that the effects on behavior and behavioral intention were mediated by these variables for the two interven-

tions, provides information that is helpful in understanding the mechanism through which effective prevention approaches work. Additional research is necessary to increase our knowledge of the ingredients of effective prevention approaches and methods of optimizing effectiveness with minority populations.

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