

Role of General and Specific Competence Skills in Protecting Inner-City Adolescents from Alcohol Use*

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ABSTRACT. *Objective:* The purpose of this longitudinal investigation was to test whether higher levels of general competence are linked to greater refusal assertiveness that is, in turn, related to less subsequent alcohol use among inner-city adolescents. *Method:* A large sample of students attending 22 middle and junior high schools in New York City participated. Students completed surveys at baseline, at 1-year follow-up and at 2-year follow-up ($N = 1,459$; 54% female). The students self-reported alcohol use, decision-making skills, self-efficacy and refusal assertiveness. Teams of three to five data collectors administered the questionnaire following a standardized protocol. The data were collected in school during a regular 40-minute class period. *Results:* According to the tested structural equation model, Decision

Making ($\beta = .07, p < .05$) and Self-Efficacy ($\beta = .24, p < .001$) predicted higher Refusal Assertiveness and this greater assertiveness predicted less drinking at the 2-year follow-up ($\beta = -.21, p < .001$). Earlier drinking predicted 2-year follow-up drinking ($\beta = .40, p < .001$). Goodness-of-fit indices were excellent ($\chi^2 = 1107.9, 238 \text{ df}, N = 1,438, p < .001$; NFI = .93, NNFI = .94, CFI = .95). *Conclusions:* The tested model had a good fit and was parsimonious and consistent with theory. This research highlights the importance of addressing decision-making skills, self-efficacy and refusal assertiveness within adolescent alcohol prevention programs. (*J. Stud. Alcohol* 61: 379-386, 2000)

OVER 100,000 deaths per year in the United States are related to excessive alcohol consumption (Doyle, 1996). Estimates of the costs to American society of alcohol abuse, including alcohol-related illness and death, were \$166.5 billion in 1995 (Harwood et al., 1998). This public health problem takes root early on, as alcohol initiation typically occurs in the teenage years. Early initiation, defined as occurring before age 15, greatly increases the chances of becoming an alcoholic compared with initiation at the legal drinking age of 21 (Grant and Dawson, 1997). Moreover, by their senior year of high school, 82% of students have tried alcohol, 64% have been drunk and nearly a third have engaged in heavy episodic drinking (i.e., five or more drinks in a row over the past 2 weeks), according to national survey data from 1997 (Johnston et al., 1998). The same survey found that, among eighth graders, 54% had tried drinking, 25% had been drunk and 15% engaged in heavy episodic drinking. Consequently, adolescents under the age of 15 who engage in drinking face an elevated risk of becoming alcoholics later in life.

Alcohol advertising now frequently targets neighborhoods with residents who are of low socioeconomic status and are ethnic minority members (Hackbarth et al., 1995). In order to combat advertising and other influences to drink, adolescents from these communities need to be able to

assertively refuse alcohol offers. In fact, adolescents who were better able to refuse alcohol offers engaged in less alcohol use and misuse (Shope et al., 1993). Other intrapersonal characteristics related to general competence, such as decision making and self-efficacy (the belief in one's ability to perform behaviors), are theorized to have a critical role in determining vulnerability to drink (Botvin, 1995; Jessor and Jessor, 1977). A deficiency in such general competence might decrease the ability to assertively refuse alcohol and other drugs; a situation that is, in turn, related to subsequent drinking. Although some research indicated that decision making and self-efficacy had direct associations with adolescent alcohol use among a predominantly white sample (Wills, 1985), other research with a predominantly minority sample failed to find any relationship between these variables and adolescent drinking (Epstein et al., 1995).

Comprehensive competence enhancement prevention programs aimed at reducing alcohol and other drug use posit that refusal-assertiveness skills need to be taught within a context of broader personal and social skills. Evaluations of such comprehensive prevention approaches have found them to be effective in numerous studies conducted with predominantly white populations and with predominantly minority inner-city populations (Botvin, 1998). Although these comprehensive skills programs appear effective in reducing adolescent alcohol use, more research is needed to examine whether broader competence is truly a necessary building block for refusal assertiveness that subsequently serves to protect adolescents from alcohol use. Due to the role of program delivery and other factors that can decrease effectiveness of a prevention intervention (Resnicow and Botvin, 1993), longitudinal etiologic

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research can be particularly helpful in developing models to test these ideas. Therefore, the current study focused on adolescents who did not receive any preventive treatment.

One test of the importance of decision making and self-efficacy in adolescent drinking is to examine their indirect effect on drinking through refusal assertiveness. If a complex decision is involved, adolescents who have not mastered decision-making skills may choose a quick solution (e.g., do what my friends do) rather than working out all the possible consequences and viewing the conflict within the context of their own personal values or beliefs (Fischhoff and Quadrel, 1991). Therefore, acquiring refusal skills may be insufficient preparation for combating social influences to drink. Similarly, if adolescents do not feel capable of performing behaviors due to low self-efficacy, then they may not utilize the refusal skills they have learned.

This research focuses on a predominantly minority inner-city sample of adolescents, a group for whom little longitudinal information concerning drinking exists. The purpose of this study was to test, with these adolescents, the rationale underlying the competence enhancement approach to alcohol prevention. Specifically, this study examines whether greater levels of general competence (decision-making skills and self-efficacy) are linked to subsequent refusal assertiveness and whether this greater refusal assertiveness is related to less subsequent alcohol use. Such a model would provide support for including a broader array of general competence skills along with assertive refusal skills within the context of an alcohol prevention program. The elucidation of a model of adolescent drinking behavior would serve to help refine approaches to alcohol prevention for inner-city minority adolescents.

Method

Overview

Participating in the study were a total of 22 middle and junior high schools in New York City (with 25% or more Hispanic students). Students were from the control schools of a longitudinal smoking prevention trial conducted in 47 schools, described in greater detail elsewhere (Botvin et al., 1992). The majority of the 22 schools served students from families with average incomes well below the federal poverty level. All sixth and seventh graders in English-speaking, mainstream classes were eligible to participate by completing the study questionnaires. Of these students, more than 90% completed the initial baseline survey. Students also completed surveys at 1-year and 2-year follow-ups. The consent procedure utilized was approved by the Institutional Review Board at Cornell University Medical College.

Participants

At baseline, 2,400 students completed questionnaires. The panel sample across baseline and 1-year and 2-year follow-ups consisted of 1,459 students (61% of baseline participants). The final sample was 1,438 students after 21 cases were eliminated because of missing data. The retention rate over the course of the 3-year study compared favorably with school-based studies whose 2-year follow-up rates ranged from 60% (Botvin et al., 1995b) to 79% (Snow et al., 1992). The mean (\pm SD) age at baseline for the panel sample was 12.4 ± 0.75 years; 54% of the sample were girls. In terms of ethnicity, this sample was 54% Hispanic, 20% black, 7% Asian, 16% white and 3% other. Approximately 70% of respondents lived in two-parent households.

Procedure

At each assessment, participating students completed questionnaires that measured self-reported drinking and psychological factors hypothesized to be related to drinking initiation. A team of three to five data collectors (of the same ethnic groups as participants) administered the surveys following a standardized protocol. Students completed these surveys during a regular 40-minute class period. Teachers were not involved in data collection activities. Students were assured that their answers would remain confidential and student identification codes, rather than names, were used to emphasize the confidential nature of the surveys. Carbon monoxide breath samples were collected before students completed the questionnaire; this has been found to enhance the veracity of self-reported alcohol use (Botvin et al., 1984).

Measures

Students completed one of two randomly distributed questionnaire forms; each form contained identical items with the order of measures on the last half of the questionnaire reversed. This procedure maximized the amount of data collected within the available time while minimizing data loss due to fatigue, boredom or inadequate time. Included on the questionnaires were items concerning drinking behavior of respondents, self-efficacy, decision-making skills and assertiveness. Since the measures had originally been developed for use with white, middle-class students, the individual scales were pilot-tested and revised, based on the results of a previous study that examined their suitability for the target population (Botvin et al., 1989). The reliabilities for the scales relevant to the current study are indicated below.

Alcohol consumption. One dichotomous (yes/no) item assessed whether the participant had "had a drink of alcohol in the last month," and a similar item assessed whether the student had "had a drink during the last week." Drinking

frequency and drunkenness frequency were assessed with a 9-point drinking scale. Specifically, students responded to the question, "How often (if ever) do you drink alcoholic beverages?" with the following response options: (1) "Never"; (2) "Tried them, but don't use them now"; (3) "Less than once a month"; (4) "Once a month"; (5) "Two or three times a month"; (6) "Once a week"; (7) "Few times a week"; (8) "Once a day"; and (9) "More than once a day." They then responded to "How often (if ever) do you get drunk?" with the following response options: (1) "I don't drink"; (2) "I drink but never get drunk"; (3) "Less than once a month"; (4) "Once a month"; (5) "Two or three times a month"; (6) "Once a week"; (7) "Few times a week"; (8) "Once a day"; and (9) "More than once a day." Students rated the quantity of drinking per drinking occasion on a 6-point scale: (1) "I don't drink"; (2) "One drink"; (3) "Two drinks"; (4) "Three or four drinks"; (5) "Five or six drinks"; and (6) "More than six drinks."

Decision making. Five items derived from a subscale of the Coping Inventory (Wills, 1986) and related to problem-solving and direct action measured decision-making skills ($\alpha = .80$). These items assessed sound decision-making skills (e.g., "When I have a problem I think about which of the alternatives is best"). Responses were rated on a 5-point scale in which 1 = "never" and 5 = "almost always."

Self-efficacy. Five items from the personal efficacy subscale of the Spheres of Control Scale (Paulhus, 1983) assessed Self-Efficacy ($\alpha = .75$). This scale measured the extent to which respondents believed they could achieve personal goals through their own efforts (e.g., "I can learn almost anything if I set my mind to it"). Responses were scored on a 5-point Likert scale in which 1 = "strongly disagree" and 5 = "strongly agree."

Refusal assertiveness. Refusal Assertiveness was measured using three items ($\alpha = .75$) derived from the Gambrill and Richey Assertion Inventory (1975). A factor analytic study of the Assertion Inventory (Wills et al., 1989) revealed a stable factor structure that included refusal assertiveness as an independent dimension representing an individual's ability to assertively refuse. In the present study, we created the Refusal Assertiveness latent factor by using three of the indicator items identified in this previously validated factor. Each item had response options on a 5-point Likert scale in which 1 = "never" and 5 = "almost always."

Results

At baseline, 41% of participants reported that they had tried alcohol, 21% drank in the past month and 5% drank in the past week. Levels of alcohol consumption increased from baseline (6th and 7th grade) to the 2-year follow-up (8th and 9th grade). Specifically, by the 2-year follow-up, 60% of 8th and 9th graders reported that they had ever drunk alcohol, 24% reported drinking in the past month and

11% drinking in the past week.

Attrition analyses

Mean differences on the alcohol measures were tested between panel and dropout students over the course of the study. No differences were found for the frequency of drinking between panel students and dropouts at the 1-year follow-up; however, dropouts at the 2-year follow-up drank more often (mean = 1.74) than the panel sample (mean = 1.64) ($F = 4.61$, 1/2,353 df, $p < .05$). In addition, dropouts at the 1-year follow-up drank a greater quantity of alcohol per occasion compared to the panel students (means = 1.47 vs 1.40) ($F = 3.88$, 1/2,362 df, $p < .05$), and dropouts at the 2-year follow-up drank more when they drank than panel students (means = 1.49 vs 1.37) ($F = 16.20$, 1/2,362 df, $p < .001$). There was no difference in drunkenness between dropouts at the 1-year follow-up and panel students. Dropouts at the 2-year follow-up were drunk more frequently than panel students (means = 1.36 vs 1.28) ($F = 9.94$, 1/2,363 df, $p < .05$). The association between attrition and drinking at least once a month were tested and no differences were found. Thus, there was only a small effect due to participant loss based on the continuous alcohol use measures and no differential loss based on the proportional analyses.

Treatment of missing data

Of the original panel sample of 1,459 students, 21 cases were missing 50% or more of the items relevant to the present study and, as a consequence, were eliminated from the final sample ($N = 1,438$). Complete data for all relevant items were available from 67% of this final sample. A full-information maximum likelihood regression-based procedure was used to impute data for those cases missing data in the final sample (Wothke, in press).

Confirmatory factor analysis

Prior to testing the hypothesized structural model, a confirmatory factor analysis (CFA) model was examined to assess how well the observed measures reflect the hypothesized latent constructs. The EQS program (Bentler, 1995) was used for the CFA and structural equations modeling (SEM). As shown in Figure 1, six latent factors were specified in the CFA or measurement model, each of which contained from three to five indicator items. Four of the latent factors were comprised of variables measured at the baseline assessment in sixth or seventh grade: the Baseline Drinking factor had loadings ranging from .54 to .86; the Decision Making latent factor had loadings ranging from .62 to .70; the Self-Efficacy latent factor had loadings ranging from .50 to .74; and the Baseline Refusal Assertiveness latent factor had loadings ranging from .41 to .93. The



FIGURE 1. Confirmatory factor analysis model (large circles represent latent constructs, rectangles represent variables and single-headed arrows represent residual variances)

Refusal Assertiveness latent factor measured 1 year later in the seventh or eighth grade had loadings ranging from .44 to .89. The Two-Year Drinking latent factor assessed in eighth or ninth grade had loadings ranging from .62 to .88. Factor loadings for all latent constructs were highly significant (all p 's < .001) and in the expected direction. The CFA analysis indicated that the measurement model was properly specified and that each factor was statistically reliable based on the hypothesized model.

Several criteria were used to evaluate the overall fit of the

CFA model and subsequent SEMs, including: (1) the chi-square p value that, if $p > .05$, indicates there are no statistically significant discrepancies between the observed data and the hypothesized model; (2) the chi-square to degree of freedom ratio, which should be less than 5.0 (Bollen, 1989); (3) the standardized root mean squared residual (SRMR), which should be less than .05; and (4) several fit indices including the Normed Fit Index (NFI), the Nonnormed Fit Index (NNFI) and the Comparative Fit Index (CFI). Each of these indices is derived by comparing the predicted covari-

TABLE 1. Correlations among latent factors from confirmatory factor analysis

Latent factor	1	2	3	4	5
1. Baseline Drinking	-				
2. Baseline Decision Making	-.10 ^c	-			
3. Baseline Self-Efficacy	-.02	.31 ^d	-		
4. Baseline Refusal Assertiveness	-.30 ^d	.27 ^d	.21 ^c	-	
5. One-Year Refusal Assertiveness	-.26 ^d	.20 ^d	.16 ^c	.35 ^c	-
6. Two-Year Drinking	-.46 ^d	-.08*	.00	-.14 ^b	-.31 ^d

* $p < .05$; ^b $p < .01$; ^c $p < .001$.

ation in the hypothesized model to that of the null model, with values greater than .90 indicating an excellent fit of the model to the data. According to these criteria, the CFA model was a good to excellent fit ($\chi^2 = 1,298.4$, 284 df, $N = 1,438$, $p < .001$; $\chi^2/df = 4.6$; SRMR = .037; NFI = .92, NNFI = .93, CFI = .94). Although the chi-square p value was significant (which indicates that additional models could be fit to the data), this is not uncommon with large models and large sample sizes (Bentler and Bonett, 1980; Marsh et al., 1988).

Table 1 shows the latent factor intercorrelations from the CFA model. Several factors were moderately to strongly intercorrelated. Not surprisingly, the strongest relationship was between Baseline Drinking and Two-Year Drinking ($r = .46$, $p < .001$). One-Year Refusal Assertiveness was also strongly associated with Two-Year Drinking ($r = -.31$, $p < .001$). Decision Making and Self-Efficacy were strongly associated ($r = .31$, $p < .001$). In summary, the CFA analysis demonstrated that the measurement model was excellent, with high factor loadings for all indicator variables.

Structural equations modeling

To test a formal model of the relationships between the predictor latent factors and outcome Drinking latent factor, an SEM was tested (Figure 2). The formal structural equations model differs from the CFA model in that arrows representing path coefficients have been added to show the hypothesized direction of relationships among the latent factors. As recommended by MacCallum et al. (1992), the first step involved testing a saturated model that estimated the paths from all exogenous latent factors to the construct of Refusal Assertiveness and to the Two-Year Follow-Up Drinking latent factor, as well as estimating the path from the indirect factor to the outcome. In addition, the covariances among all exogenous latent factors were estimated in testing the saturated model. The error terms for each matching drinking indicator at baseline and at the 2-year follow-up, as well as the error terms for the matched refusal assertiveness indicators at baseline and 1-year follow-up, were initially freely estimated because it was expected that measurement error would be similar. This was true for

drinking frequency, drinking quantity and for two of the refusal assertiveness items. Therefore, these correlated errors were left to be freely estimated.

This model had four exogenous latent factors (Baseline Drinking, Baseline Decision-Making, Baseline Self-Efficacy and Baseline Refusal Assertiveness), one intervening latent factor (One-Year Follow-Up Refusal Assertiveness) and one outcome latent factor (Two-Year Follow-Up Drinking). In the final model, paths that were not statistically significant were trimmed from the model. Therefore, the direct paths from Decision Making, Self-Efficacy and Refusal Assertiveness (all measured at baseline to Two-Year Follow-Up Drinking) were trimmed. The results of testing this final model are illustrated in Figure 2.

Each of the three baseline exogenous latent factors directly predicted Refusal Assertiveness, controlling for Baseline Refusal Assertiveness (beta = .24, $p < .001$): Baseline Decision Making (beta = .09, $p < .05$) and Baseline Self-Efficacy (beta = .07, $p < .05$) predicted higher Refusal Assertiveness while Baseline Drinking predicted lower Refusal Assertiveness (beta = -.18, $p < .001$). One-Year Refusal Assertiveness predicted less Two-Year Follow-Up Drinking (beta = -.21, $p < .001$). Finally, as expected, Baseline Drinking predicted Two-Year Follow-Up Drinking (beta = .40, $p < .001$). In terms of goodness-of-fit indices, there was an excellent fit of the model to the data ($\chi^2 = 1,107.9$, 283 df, $N = 1,438$, $p < .001$; $\chi^2/df = 3.9$; SRMR = .036; NFI = .93, NNFI = .94, CFI = .95). In summary, the findings shown in Figure 2 indicate that each of the four exogenous latent factors significantly predicted Refusal Assertiveness, which, in turn, predicted Two-Year Follow-Up Drinking.

Discussion

In a longitudinal study conducted with adolescents attending inner-city schools, general competence (sound decision-making skills and high self-efficacy) measured at the baseline assessment had an indirect relationship with decreased alcohol use 2 years later through refusal assertiveness measured at the 1-year follow-up assessment. According to these findings, general competence is an

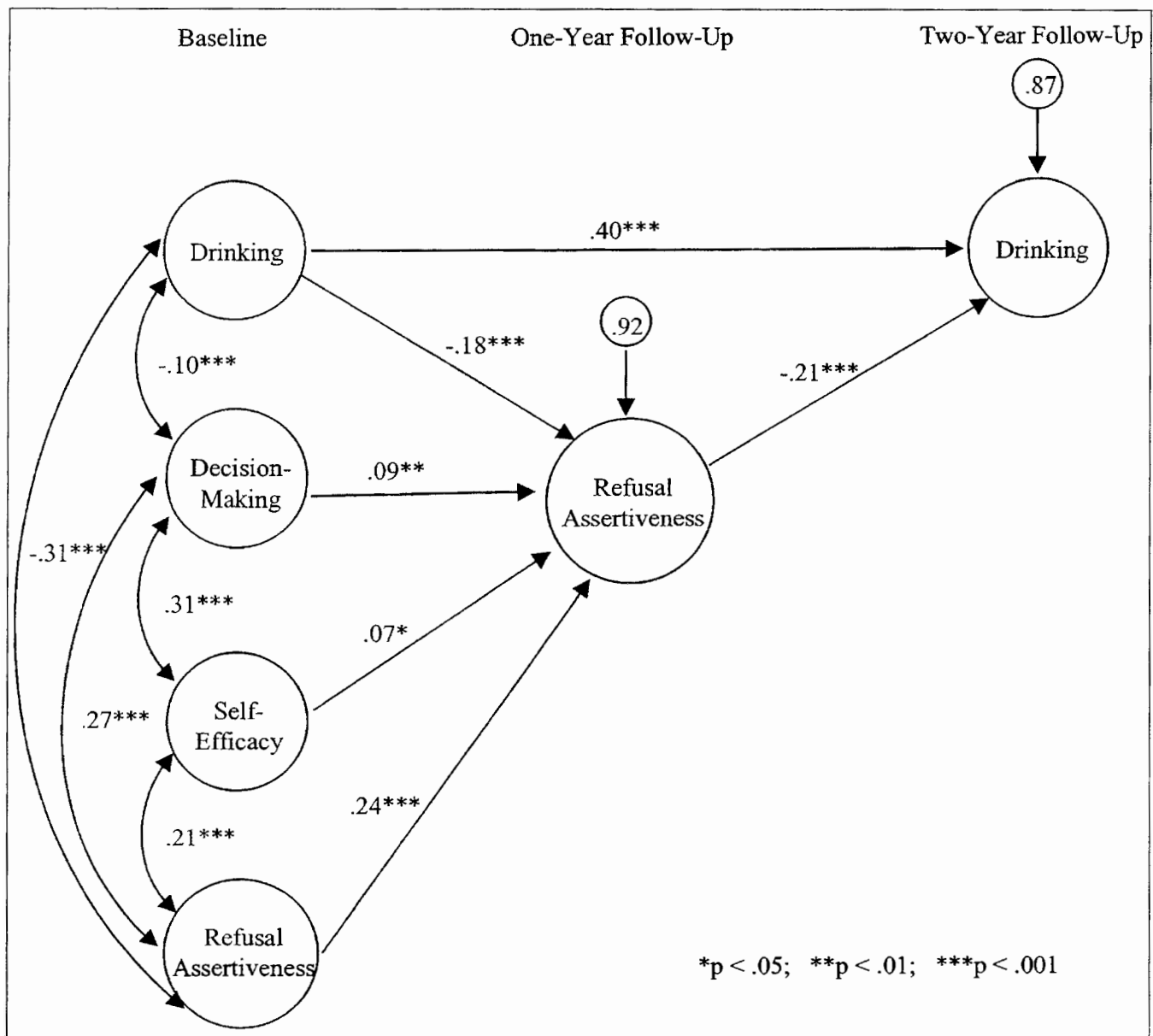


FIGURE 2. Structural equation model (large circles represent latent factors and small circles with numbers represent residual variances)

important building block for more specific refusal assertiveness, providing support for the theory underlying the competence enhancement approach to alcohol prevention. Adolescents who are more competent (based on sound decision-making skills and high self-efficacy) appear better prepared to engage in more frequent use of refusal assertiveness. Greater refusal assertiveness skills then serve to protect these adolescents from subsequent alcohol behavior. This was tested among adolescents who had not participated in a prevention program. In addition, these findings applied to a predominantly minority sample of urban youth. Research focusing on this population is greatly needed to better understand how to develop effective alcohol preven-

tion programs for it.

Since refusal-skills training approaches to alcohol prevention have been proven effective, the belief may exist that providing further skills training is not necessary. The findings of this study suggest that more comprehensive skills training to enhance decision-making and self-efficacy would strengthen refusal assertiveness, thereby decreasing further alcohol use. In fact, it has been argued that the most promising prevention strategy appears to be a comprehensive one, incorporating a broad array of skills (Hansen, 1992; Herrmann and McWhirter, 1997). A wide range of skills helps motivate and inform adolescents beyond what refusal skills alone can do. The current study's results sug-

gest that the competence enhancement approach is worth the extra time and effort required in the classroom over and above refusal skills training alone.

Competence enhancement prevention approaches have been shown to be effective in a multitude of studies with both predominantly white suburban populations and predominantly minority inner-city populations (e.g., Botvin, 1998), including those with long-term follow-ups (Botvin et al., 1995a,b). This approach posits that the lack of generic skills for coping with life increases vulnerability to interpersonal and intrapersonal pressures to drink alcohol. The personal and social skills targeted in these programs include decision-making and problem-solving skills, cognitive skills for resisting interpersonal and media influences, skills for enhancing self-esteem, coping strategies for stress and anxiety, general social skills and general assertive skills. Teaching these skills is intended to increase self-efficacy. This set of skills provides adolescents with a means of dealing with challenges they face in their day-to-day lives including, but not limited to, alcohol use.

The present study suggests that adolescents lacking adequate decision-making skills may be less able to evaluate when to use refusal skills in a situation in which there is pressure to drink alcohol. Conversely, possession of good decision-making skills appears to increase the likelihood of engaging in more frequent refusal assertiveness just as being more self-efficacious enhances the use of refusal skills. Consequently, alcohol prevention programs for inner-city populations of predominantly minority adolescents ought to include components relevant to decision making and to developing self-efficacy, along with refusal skills training.

There are several limitations to this study. First, only a limited number of variables were estimated in the model reported here; therefore, this model is not a comprehensive one of alcohol behavior among inner-city adolescents. However, it is a specific and parsimonious model that is consistent with prevention research on youth from inner-city regions (e.g., Botvin et al., 1995b). Second, data were collected only from a school-based sample and cannot be generalized to nonstudent populations. Nevertheless, because this study focused on the middle-school years when dropout rates remain low, and absent students were pursued on two return data collections, this is less of a problem than if the study had been conducted in high school without active pursuit of absentees. Third, since the sample consisted of predominantly minority students residing in New York City and belonging to a low socioeconomic group, it is possible that results from other ethnic groups, other urban regions and other socioeconomic groups could differ. Fourth, the loss of heavier drinkers may have attenuated the estimation of variable relationships somewhat. Fifth, all data were self-report.

The longitudinal model tested in the current study suggests that general competence enhancement, meant to affect

decision-making skills and self-efficacy, is an important building block for preventing adolescent alcohol use prior to training in appropriate resistance skills. When adolescents are more capable of making sound decisions and are more confident, they appear to be better equipped to utilize refusal skills if presented with situations in which they might drink alcohol. To be most effective, alcohol prevention programs should provide a broader focus on competence enhancement during the middle-school years. Finally, these findings suggest that this approach would be useful with predominantly minority adolescent populations who live in inner-city regions.

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