

Chapter 12

Understanding Marijuana Use in a National Sample of Adolescents

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The concern of the present report is with the personality, social, and behavioral correlates of involvement with marijuana in a survey of a nationwide sample of junior and senior high school youth. Our aims are threefold: first, to use the national data to test the explanatory usefulness of a social-psychological theory of youthful problem behavior (Jessor & Jessor, 1977) in accounting for variation in involvement with marijuana; second, to examine the generality of the account across different sex, age, and ethnic groups; and third, to compare the psychosocial correlates of marijuana use with the psychosocial correlates of problem drinking that were found in an earlier analysis of the same nationwide data set (Donovan & Jessor, 1978).

Although much previous research has shown that there are psychosocial and behavioral differences between adolescents who have used marijuana and those who have not, and also between adolescents who use marijuana heavily and those whose use is more limited, most of the research has been atheoretical, limited to only a few psychosocial measures, or based upon small or selected samples (Braucht, Brakarsh, Follingstad, et al., 1973; Gorsuch & Butler, 1976; Jessor, 1979; Kandel, 1975, 1978; Sadava, 1975). In the present research, variation in marijuana use is approached from a more comprehensive social-psychological perspective, that of “Problem Behavior Theory” (Jessor & Jessor, 1977, 1978; Jessor, R., 1976; Jessor, Jessor, & Finney, 1973). In this framework, marijuana use is considered as an instance of a larger class of “problem” behaviors, that is, behaviors that are likely to elicit negative sanctions from the larger society. Such behaviors—for example, early sexual experience, problem drinking and even drinking per se, and certain delinquent types of behavior, as well as illicit drug use—can also serve, in adolescence, to represent a

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claim on a more mature status or to mark a transition in psychosocial development. The occurrence of problem (or transition) behaviors is accounted for in Problem Behavior Theory by the interaction of three systems of variables—the personality system, the perceived environment system, and the behavior system.

Within each of these three systems it is possible to specify the degree of *prone-ness* to problem behavior or the likelihood of occurrence of problem behavior for a given adolescent. Problem-behavior proneness in the personality system refers to attitudes, values, beliefs, and expectations that constitute instigations to engage in problem behavior or attenuated controls against such behavior. For example, high value on independence relative to value on academic achievement, and low expectations for achieving academic goals are both conceptualized as instigations to problem behavior; a tolerant attitude toward deviant or socially-disapproved behavior, and low religiosity are conceptualized as attenuated personal controls in the personality system according to Problem Behavior Theory.¹

In the environment system, problem-behavior proneness refers to perceptions of low supports and controls from significant others, and of approval for and models for engaging in problem behavior. Greater influence from friends than parents, low consensus between parents and friends in their expectations, and greater perceived approval, pressure, and models for drug and alcohol use are variables in the perceived environment system that increase the likelihood of occurrence of problem behavior. In the behavior system, finally, problem-behavior proneness refers to the degree of involvement in other problem behaviors, on the one hand, and in conventional behaviors such as church attendance and school performance, on the other. The greater the degree of problem-behavior proneness that is present in the personality, the perceived environment, and the behavior systems, the greater the expected involvement in problem behavior, including the use of marijuana.

Problem Behavior Theory was employed as part of the conceptual framework for the 1974 National Study of Adolescent Drinking Behavior, Attitudes, and Correlates carried out by the Research Triangle Institute under contract with the National Institute on Alcohol Abuse and Alcoholism (Rachal, Williams, Brehm, et al., 1975; Rachal, Hubbard, Williams, et al., 1976). Previous analyses of these national sample data showed that the variables in the theory provide an illuminating account of adolescent problem drinking (Donovan & Jessor, 1978). The present study extends those analyses to a concern with variation in marijuana use in a nationwide sample of American adolescents.

Method

The 1974 National Study provided nationwide baseline data on the prevalence and correlates of adolescent drinking, problem drinking, and drug use. Since details of the sampling design and field procedures employed in the collection of these data are available in an extensive report by Rachal, et al. (1975), only brief descriptions need be given here.

¹ See Jessor and Jessor, 1977, for a more elaborate discussion of the rationale underlying the variables in each system.

Participants

A two-stage, stratified random sample was drawn from the population of adolescents in grades 7 through 12 in the 48 contiguous states and the District of Columbia. The primary sampling frame consisted of all counties within these states stratified by census region, county population, and ethnic status. Within each of the 50 counties (or groups of counties) subsequently selected, a secondary sampling frame consisting of junior and senior high school homerooms stratified by grade level (grades 7–8, 9–10, 11–12) was established, and a sample of 643 homerooms was drawn (90 per cent of those contacted). All of the students in these homerooms (16,181) were asked to participate in the study, and 13,122 (81 per cent) of them completed questionnaires. This student participation rate of 81 per cent multiplied by the homeroom participation rate of 90 per cent yielded an overall response rate of 72.7 per cent (Rachal, Williams, Brehm, et al., 1975).

The obtained sample is 48 per cent male and 52 per cent female, and its self-reported ethnic distribution is as follows: Caucasian (Anglo), 69 per cent; Spanish American, 12 per cent; Black, 7 per cent; Native American, 6 per cent; Asian American, 2 per cent; and Other (or no answer), 4 per cent. A wide distribution of socioeconomic status, school grade-level, and geographic area of the country was also obtained.²

Procedure

Data were collected during school hours over a four-week period in the spring of 1974 using a 35-page self-administered questionnaire. The questionnaire consisted primarily of closed-format questions and required about 45 minutes to complete.

To maintain confidentiality, no names were written on the questionnaires and the respondent was asked to place the completed questionnaire in an envelope and to seal it. Confidentiality was guaranteed through the use of an elaborate system of identification numbers.

Measurement of the Psychosocial Variables of Problem Behavior Theory

Only a subset of the variables from the larger framework of Problem Behavior Theory could be included in the questionnaire used in the National Study. Five personality system variables were assessed: value on independence relative to the value on

² Respondents were distributed across school grades as follows: 7th, 19 per cent; 8th, 18 per cent; 9th, 18 per cent; 10th, 14 per cent; 11th, 17 per cent; and 12th, 14 per cent. In terms of census regions, 20 per cent were from the Northeast, 19 per cent were from the North Central, 28 per cent were from the South, and 32 per cent were from the West. Parental distribution on the NORC occupational categories was as follows: Semiskilled, 22 per cent; Farmer, 5 per cent; Skilled, 21 per cent; Office-Sales, 16 per cent; Managerial, 18 per cent; and Professional, 19 per cent.

academic achievement; expectations for academic achievement; attitudinal tolerance of deviance; religiosity; and positive-relative-to-negative functions of (or reasons for) drinking. Seven perceived environment system variables were assessed: compatibility between parents' and friends' expectations; relative parent versus friends' influence; family approval of drinking; friends' approval for drinking; friends as models for drinking; friends' pressure for marijuana use; and friends as models for marijuana use. The first two of these are considered *distal* aspects of the perceived environment since they are conceptually remote from the specific behaviors being predicted. The latter five are considered *proximal* aspects of the perceived environment because they directly implicate specific behaviors—in the present case either drinking or marijuana use—and actually refer to them in the measures. Only the perceived environment system includes measures proximal to marijuana use; personality measures proximal to marijuana use were not included in this study. On the basis of this difference alone, it is to be expected that the perceived environment system will correlate more highly than the personality system with the use of marijuana.

Five behavior system variables were assessed: frequency of general deviant (delinquent-type) behavior; frequency of drunkenness in the past year; psychedelic-amphetamine-barbiturate use; frequency of church attendance in the past year; and school performance as measured by grade-point average.

The majority of these variables were measured by multiple-item scales derived from Problem Behavior Theory and abbreviated from versions originally developed to test the theory in a longitudinal study of adolescent psychosocial development (Jessor & Jessor, 1977). The present scales are described in detail elsewhere (Donovan & Jessor, 1978). Psychometric properties of the scales are more than adequate: Cronbach *alpha* estimates of reliability (Cronbach, 1951) ranged from .78 to .88 for the personality system measures and from .62 to .90 for the (generally shorter) measures of the perceived environment system.

Measurement of Involvement with Marijuana

The present analyses are based on the 10,405 adolescents (4,845 males and 5,560 females) whose answers to the questions on drinking and drug use behavior were logically consistent *and* who answered all four of the questions that assessed involvement with marijuana.³ This subsample, constituting 79 per cent of the overall

³A group of 808 adolescents were excluded because they had incomplete data on the four questions used to classify adolescents on involvement with marijuana. An additional 1,909 adolescents were excluded because internal checks of their data uncovered logical inconsistencies in their answers either to the questions on drinking behavior or to the questions on drug use behavior. Logically inconsistent answers may indicate non-truthful, random, or unreliable responding. The resulting group of 10,405 respondents contains abstainers as well as drinkers, unlike the sample in the earlier report on problem drinking (Donovan & Jessor, 1978) which focused solely on the drinkers.

national sample, has been shown elsewhere to be representative of the total sample on several sociodemographic dimensions.⁴

Near the end of the questionnaire, respondents were asked a series of questions regarding their experience with various illicit drugs. Four questions were employed to serve as an index of degree of involvement with marijuana. The questions had been used in previous research (Jessor & Jessor, 1977; Jessor, R., 1976; Jessor, Jessor, & Finney, 1973; Sadava, 1970, 1972):

- “Have you ever tried marijuana (pot, grass, Mary Jane, weed, reefers, hash)?”
- “Have you ever been high or stoned on marijuana to the point where you were pretty sure that you had experienced the drug effect?”
- “Do you or someone very close to you usually keep a supply of marijuana so that it’s available when you want to use it?” and
- “Do you use marijuana a couple of times a week or more when it’s available?”

The four questions were designed to form a unidimensional, cumulative scale of increasing involvement with marijuana. A respondent who answered affirmatively to the second, third, or fourth questions was expected to have answered all the preceding questions affirmatively. Scalogram analysis (Guttman, 1950) demonstrated that these items do indeed form a satisfactory Guttman scale: the reproducibility coefficient was .94; the minimum marginal reproducibility was .80; and the coefficient of scalability (Menzel, 1953) was .68. Over 86 per cent of the respondents gave responses conforming to the requirements of a cumulative scale.⁵ Other psychometric characteristics of the scale were also satisfactory: the *alpha* reliability was .84, and the homogeneity ratio (Scott, 1960) was .57. In the correlational and regression analyses which follow, this measure of involvement with marijuana is treated as an interval-level variable that reflects an underlying, continuous dimension.

Results

Findings on three major topics are presented in this section. First, each measure of the psychosocial and behavioral variables is correlated with the measure of involvement with marijuana in order to determine if they relate in the direction expected

⁴Chase JA and Jessor R: A Social-Psychological Analysis of Marijuana Involvement among a National Sample of Adolescents. Adolescent Drinking Behavior Project. Report No. 3, Institute of Behavioral Science, University of Colorado, 1977. (Note: Report no longer available, and its main findings are included in the present paper.)

⁵Nearly all (89 per cent) of the noncumulative response patterns were due to the third item. In most of these cases, adolescents who had responded negatively to the other three items responded positively to this one. Since the item includes the phrase “someone very close to you,” the pattern suggests that it was the close friends who kept a supply of the drug. If this specific pattern of responses is rescored to reflect the *opportunity* to use marijuana, a level that would be intermediate between no use of marijuana and actual use of the drug, the reproducibility coefficient becomes .98 and the coefficient of scalability becomes .91 in the new Guttman scale (Guttman, 1950).

from the logic of Problem Behavior Theory. Second, multiple regression analyses predicting involvement with marijuana are presented in order to appraise the *combined* explanatory power of the measures of Problem Behavior Theory. And third, the psychosocial correlates of involvement with marijuana are compared to the psychosocial correlates of problem drinking reported earlier (Donovan & Jessor, 1978).

Psychosocial Correlates of Adolescent Involvement with Marijuana

Pearson correlation coefficients between the measures of 17 personality, perceived environment, and behavior system variables and the measure of involvement with marijuana are presented in Table 12.1. Every one of these psychosocial variables is significantly correlated with marijuana involvement. In all cases, the correlations are in the direction expected from Problem Behavior Theory, and they are similar for both males and females.

Adolescents whose scores reflect greater theoretical proneness for problem behavior tend to be more involved in the use of marijuana than are adolescents whose personality, social, and behavioral scores indicate lower problem-behavior proneness. Higher instigations for problem behavior, lower personal controls against problem behavior, greater orientation toward friends than toward parents, greater perceived support and models for drinking and drug use, greater involvement in other forms of problem behavior, and lesser involvement in conventional behavior are all associated with greater involvement in the use of marijuana. Some of the correlations, especially those for measures of the proximal environment such as perceived pressure and perceived models for marijuana use, reach substantial magnitudes.

When these analyses are replicated within each of ten subsamples differing in sex and ethnic background (Anglo, Spanish American, Black, Native American, and Asian American males and females), over 80 per cent of the correlations of the psychosocial measures with the measure of involvement with marijuana are statistically significant at the .05 level or beyond (two-tailed test). Thus, there is a substantial degree of cross-sex as well as trans-ethnic generality to the relationships shown in Table 12.1. For the most part, also, the correlation coefficients for males and females of the same ethnic background are of similar magnitude. Of the 17 personality, perceived environment, and behavior system variables, 13 exhibit considerable generality across all five ethnic groups. The four exceptions—expectations for academic recognition, parent-friends compatibility, parent-friends influence, and family approval of teenage drinking—generally correlate significantly for only one sex or the other in the minority ethnic subsamples.

Of the four sociodemographic measures shown at the bottom of Table 12.1, only age shows a modest relationship, for both sexes, with marijuana use. As would be expected, the older adolescents tend to have greater involvement with marijuana

Table 12.1 Pearson Correlations of the Psychosocial Measures with the Measure of Involvement with Marijuana

Psychosocial Measures	Males (n = 4845)	Females (n = 5560)
<i>Personality System</i>		
<i>Personal Instigations</i>		
Independence-Achievement Value Discrepancy	.25**	.27**
Expectations for Academic Achievement	-.13**	-.11**
<i>Personal Controls</i>		
Intolerance of Deviance	-.38**	-.40**
Religiosity	-.31**	-.34**
Drinking Functions Disjunction	.24**	.24**
<i>Perceived Environment System</i>		
<i>Distal Environment</i>		
Parent-Friends Compatibility	-.18**	-.19**
Parent-Friends Influence	.21**	.22**
<i>Proximal Environment</i>		
Family Approval of Drinking	.15**	.17**
Friends' Approval of Drinking	.27**	.29**
Friends as Models for Drinking	.43**	.46**
Friends' Pressure for Marijuana Use	.54**	.53**
Friends as Models for Marijuana Use	.67**	.66**
<i>Behavior System</i>		
<i>Problem Behavior</i>		
General Deviant Behavior	.45**	.51**
Times Drunk in Past Year	.61**	.65**
Psychedelic-Amphetamine-Barbiturate Use	.64**	.64**
<i>Conventional Behavior</i>		
Church Attendance Frequency	-.20**	-.23**
School Performance	-.16**	-.14**
<i>Demographic Variables</i>		
Age in Months	.28**	.21**
Father's Education	.01	.05*
Mother's Education	-.00	.05**
Family Socioeconomic Status	.02	.05**

*p < .01 (two-tail test)

**p < .001 (two-tail test)

than the younger adolescents. However, it is clear that this relationship between age and marijuana involvement does not account for the psychosocial correlations in the rest of the Table. To demonstrate this, partial correlations were computed between each of the psychosocial measures and marijuana use while statistically holding age constant; the resulting partial correlations are not very different from the simple

correlations presented in Table 12.1. Age of the adolescents therefore has little effect on the relationship of problem-behavior proneness to involvement with marijuana within this junior-senior high school sample.

A final point should be made about the data in Table 12.1. The correlations of the behavior system measures with marijuana use suggest that the use of marijuana may be part of a syndrome of problem behavior in adolescence rather than an isolated action. As can be seen, there are substantial positive correlations with the other problem-behavior measures (general deviant behavior, frequency of drunkenness in the past year, and use of other illicit drugs) and significant negative correlations with the measures of conventional behavior (church attendance and school performance).

The Multivariate Account of Involvement with Marijuana

The significant correlations at the bivariate level provide the warrant for appraising the combined role of the theoretical variables in accounting for variation in adolescent involvement with marijuana. Multiple regression analysis was used, with four sets of predictor variables employed in sequence. The first set of predictors includes the five personality measures that represent the multivariate contribution of the personality system. The second set is composed of the seven measures that represent the role played by the perceived environment system. The third predictor set consists of the 12 measures from both the personality and the perceived environment systems and represents their joint influence. And finally, the fourth set of predictors, the Total Set, is composed of 16 variables that represent the combined contribution of the three major conceptual domains of Problem Behavior Theory (personality, the perceived environment, and behavior).

Table 12.2 presents the multiple correlation coefficients (R s) resulting from the stepwise regressions for each of the four sets of measures on the measure of involvement with marijuana. The multiple correlations are presented separately for males and females, and also for the ten sex-by-ethnic subsamples. The squared multiple correlations (R^2 s) are also given in the table in order to indicate the proportion of the variance in involvement with marijuana that is accounted for by each set of predictor variables.

Taken together as systems, the variables of Problem Behavior Theory account for significant and substantial portions of the variation in adolescent marijuana use. As shown in Section D of Table 12.2, the Total Set of 16 psychosocial predictors representing the overall framework of the theory yields multiple correlations of .752 for males and .760 for females. The Total Set therefore accounts for more than one-half of the variance in marijuana use for the Total Sample males ($R^2 = .566$) and the Total Sample females ($R^2 = .577$). The results for the ten sex-by-ethnic subsamples are very similar to these.

Section A of Table 12.2 shows the results of the regression analyses for the set of personality system predictors. In combination, the five personality measures account for about 19 per cent of the variation in marijuana use in the Total Samples (R^2 s of

Table 12.2 Multiple Correlations of the Psychosocial Measures with the Measure of Marijuana Involvement

Predicting Involvement with Marijuana	Males				Females			
	Multiple R	% of Variance (R^2)	Adjusted R^2	Overall F -ratio	Multiple R	% of Variance (R^2)	Adjusted R^2	Overall F -ratio
<i>A. Personality System Predictors</i>								
Total Sample	.437	19.1	19.1	229.1	.453	20.5	20.4	286.7
Anglos	.440	19.4	19.3	168.4	.472	22.2	22.1	227.0
Spanish Americans	.474	22.4	21.7	28.6	.355	12.6	11.9	17.4
Blacks	.419	17.6	16.3	13.4	.377	14.2	13.3	14.8
Native Americans	.341	11.6	10.1	7.6	.406	16.5	15.1	12.0
Asian Americans	.531	28.2	23.6	6.1	.303	9.2	3.9	1.7 ^{ns}
<i>B. Perceived Environment System Predictors</i>								
Total Sample	.692	47.9	47.8	634.5	.680	46.3	46.2	682.8
Anglos	.693	48.0	47.9	539.1	.694	48.2	48.1	526.6
Spanish Americans	.697	48.6	47.8	66.5	.635	40.4	39.7	58.1
Blacks	.593	35.1	33.3	19.3	.597	35.6	34.3	28.0
Native Americans	.762	58.0	57.0	56.6	.682	46.5	45.3	37.5
Asian Americans	.790	62.5	59.0	17.8	.628	39.4	34.4	7.8
<i>C. Personality and Perceived Environment System Predictors</i>								
Total Sample	.702	49.3	49.2	391.8	.692	47.9	47.7	424.1
Anglos	.701	49.1	48.9	281.2	.703	49.5	49.3	352.7
Spanish Americans	.721	51.9	50.7	43.9	.647	41.8	40.6	35.7
Blacks	.641	41.1	38.4	15.5	.619	38.4	36.3	18.2
Native Americans	.779	60.6	59.0	36.2	.708	50.2	48.2	24.9
Asian Americans	.821	67.3	61.7	12.0	.636	40.4	32.2	4.9
<i>D. Total Set of Predictors^a</i>								
Total Sample	.752	56.6	56.4	419.1	.760	57.7	57.6	472.5
Anglos	.751	56.4	56.2	301.7	.768	58.9	58.8	378.8
Spanish Americans	.768	59.0	57.6	43.5	.753	56.6	55.5	48.3
Blacks	.723	52.2	49.0	16.4	.717	51.4	49.3	24.5
Native Americans	.801	64.1	62.2	33.2	.758	57.4	55.1	24.7
Asian Americans	.849	72.1	65.4	10.7	.726	52.7	44.1	6.1

(continued)

Table 12.2 (continued)

Note: Multiple R s are multiple correlation coefficients resulting from stepwise multiple regressions using all predictor variables in each set with a tolerance level of .001 to predict marijuana involvement. Percent of variance is the square of the Multiple R , expressed as the percentage of the variance in marijuana involvement that is accounted for by the set of predictors. The adjusted R^2 values provide less biased estimates of the R^2 s in the population. All of the overall F -ratios save one are statistically significant at the .001 level or beyond. Subsample sizes are as follows: 4,845 Total Sample males and 5,560 females; 3,511 Anglo males and 3,977 females; 501 Spanish American males and 609 females; 257 Black males and 363 females; 295 Native American males and 310 females; and 83 Asian American males and 92 females

*Psychedelics-amphetamines-barbiturate use was not included as a predictor in this set

.191 and .205 for males and females, respectively). For the five male subsamples differing in ethnic background, the squared multiple correlations are fairly similar to this, while several of the R^2 s for the female subsamples are somewhat lower. These R^2 s probably underestimate the potential explanatory power of the personality system for marijuana use because, as noted earlier, personality variables proximal to drug use were not assessed in the national study.

In the stepwise regression method employed here, the five personality measures were selected by the program for use in the equation in the order reflecting their differential predictive power: first, attitudinal tolerance of deviance, then religiosity, independence-achievement value discrepancy, drinking functions disjunction, and finally, expectations for academic recognition (the latter had a non-significant F -to-enter). This same order of entry of the predictors held for both the Total Sample males and females. Tolerance of deviance also was first to enter in all of the subsamples, and religiosity entered second in eight of the ten subsamples. These two personal control variables account for almost all of the variance in marijuana involvement that is explained by the personality system.

The perceived environment system predictors (see Section B of Table 12.2) accounted for about twice as much of the variation in marijuana use as did the personality predictor set. The seven perceived environment measures, taken together, yield multiple R s of .692 and .680 for the Total Sample males and females, and the respective R^2 s are .479 and .463. The perceived environment predictors accounted for similar proportions of the variance in involvement with marijuana in the sex-by-ethnic subsamples. Despite the fact that nearly all the predictors had significant F -to-enter, most of this predictive power is attributable to a single variable—friends as models for marijuana use. This measure enters first in all ten subsamples, and friends' pressure for marijuana use enters second in eight of the subsamples (but not for the Asian American males or females). The two environment variables that are proximal to marijuana use thus account for most of the predictive power of the perceived environment set.

The 12 predictor measures representing the combined influence of the personality system and the perceived environment system account for only slightly more (1–3 per cent) of the variation in involvement with marijuana than is accounted for

by the perceived environment set alone (see Section C of Table 12.2). Multiple correlations of .702 and .692, and R^2 s of .493 and .479, were obtained for the Total Sample males and females, respectively.⁶

For both the Total Sample males and females, the predictors entered the regression equation in the following order: friends as models for marijuana use, attitudinal tolerance of deviance, friends' pressure for marijuana use, and religiosity, followed by the less important predictors in no consistent order. For all of the sex-by-ethnic subsamples, friends as models for marijuana use was the first predictor to enter the equations; friends' pressure for marijuana use was either the second predictor to enter, or third, following either tolerance of deviance or religiosity in most of these subsamples. Thus, of the four most important predictors, two represent the perceived environment system and two represent the personality system—an outcome supporting the general approach of Problem Behavior Theory.

The Total Set of 16 predictors accounts for more than one-half of the variance in marijuana use for the Total Sample males and females (R^2 s = .566 and .577, respectively; see Section D of Table 12.2), and there is relatively little variation in the size of the R^2 s from one to another of the sex-by-ethnic subsamples. For both the Total Sample males and females, the three most important predictor variables, in order, were: friends as models for marijuana use, times drunk in the past year, and involvement in general deviant behavior. For six of the ten subsamples, friends as models for marijuana use is most important, followed by times drunk in the past year; the reverse order holds for the other four subsamples. The personality predictors were generally less important predictors than the perceived environment measures and the behavior system measures when all were considered jointly.

It was not a main concern of this study to demonstrate an independent contribution of each predictor system to the explanation of variance in the criterion, and, of course, the theoretical independence of the variable sets is quite a different matter than the independence of particular measures. Nevertheless, we can demonstrate that personality makes an independent contribution to the explanation of marijuana use beyond that provided by the perceived environment. In order to do this, we balanced the two systems by excluding the two proximal measures from the perceived environment set, namely, friends as models for marijuana use, and friends' pressure for marijuana use. The reduced set of five perceived environment predictors now yields R^2 s of .218 and .239 for the Total Sample males and females, respectively. Adding the five personality predictors to this set increases the R^2 s to .268 and .293, respectively. These increments of approximately 5 per cent are statistically significant and represent the independent contribution of the personality measures.

⁶That the personality predictors, when combined with the perceived environment predictors, do not add more to the explanation of marijuana involvement in this instance would seem to be due to two reasons: first, none of the personality variables assessed here is proximal to marijuana use while two of the perceived environment variables are; second, psychosocial proneness to problem behavior in the two systems is correlated as might be expected.

Comparing the Psychosocial Correlates of Marijuana Use with Those of Problem Drinking

The correlations presented earlier in Table 12.1 suggested that there may be a syndrome of problem behavior in adolescence, the occurrence of one being associated with the occurrence of others. Such a conclusion is strengthened by the fact that the pattern of relations of the psychosocial measures to marijuana use in Table 12.1 is very similar to the pattern of relations of those same measures to adolescent problem drinking (Donovan & Jessor, 1978). For the purposes of the present study, correlation coefficients were computed, on the same sample of 10,405 adolescents, between the psychosocial measures and Times Drunk in the Past Year, a measure of problem drinking.⁷ Of the 16 coefficients that can be compared directly, ten differ in magnitude by only .04 or less, and this is true for both males and females. Thus, marijuana involvement and problem drinking not only tend to co-vary, but they also appear to be the outcome of the same theoretical pattern of problem-behavior proneness.

An examination of the six measures that correlate differently with drunkenness than they do with marijuana use is especially illuminating in this connection. Three of the measures (positive-relative-to-negative drinking functions, friends' approval for drinking, and friends as models for drinking) all correlate significantly higher ($p < .001$ for the *difference between* correlations) with the problem drinking measure (times drunk in the past year) than they do with the measure of involvement with marijuana. The other three measures (friends' pressure for marijuana use, friends as models for marijuana use, and experience with illicit drugs other than marijuana) all correlate significantly higher with marijuana use than they do with the drunkenness measure.⁸ Thus, despite the significant correlations of all these measures with *both* criterion variables, it is clear that the drinking-specific measures relate more strongly to problem drinking while the drug-specific measures relate more strongly to involvement with marijuana.

These findings about the behavior-specific psychosocial measures suggest that adolescents who have used marijuana but who are not problem drinkers should differ on these measures from adolescent problem drinkers who have not used marijuana or other illicit drugs,⁹ even though they may be similar on the other measures

⁷It should be clear that this sample differs from that in the earlier report by Donovan and Jessor (1978) since it includes both drinkers and abstainers.

⁸The correlations between times drunk in the past year and each of these six variables are as follows for the males and females, respectively: drinking functions disjunctions (.36 and .34), friends' approval for drinking (.35 and .37), friends as models for drinking (.56 and .57), friends' pressure for marijuana use (.46 and .47), friends as models for marijuana use (.53 and .55), and psychedelics-amphetamines-barbiturates use (.45 and .46).

⁹Adolescents were considered problem drinkers if they had been drunk six or more times in the past year *or* if they had experienced negative consequences due to drinking at least twice in the past year in three or more of five different areas (trouble with teachers, criticism from dates, difficulties with friends, trouble with the police, and driving while under the influence of alcohol). The modal

of problem-behavior proneness. Given the large size of the nationwide sample, it was possible—despite the general co-variation of these problem behaviors noted above—to locate a sufficient number of adolescents who were involved in one but not the other of these two problem behavior areas.¹⁰ Table 12.3 presents the means on all the psychosocial variables for these two groups of adolescents, for both males and females.

Adolescents who have used marijuana (but who are not problem drinkers) are quite similar in mean scores on the majority of the personality, perceived environment, and behavioral variables to problem drinking adolescents who have not used any illicit drugs. The only statistically significant differences between the two groups that are consistent for both of the sexes occur on the behavior-specific measures that were mentioned above. The problem drinkers place greater importance on the positive-relative-to-the-negative functions of drinking than do the marijuana users, and they perceive greater friends' approval for drinking and friends as models for drinking than do the latter (family approval of drinking does not differentiate). In contrast, the marijuana users perceive greater pressure from their friends to use marijuana and perceive more models for marijuana use among their friends than do the problem drinkers. In summary, despite similarity on most measures of problem-behavior proneness, there are substantial and consistent differences between the groups on those psychosocial measures that relate most directly to the particular problem behaviors in which they are differentially involved.

Discussion

These analyses of a nationwide sample of American adolescents indicate that marijuana use is systematically related to the network of psychosocial variables specified in Problem Behavior Theory (Jessor & Jessor, 1977). Measures of personality, the perceived environment, and behavior correlate significantly with marijuana use and, taken together, they are able to explain over 50 per cent of the variance in adolescent involvement with marijuana. The results are strengthened by their replication across different sex and ethnic groups, and also by their consonance with the findings from a more intensive, longitudinal study in a local sample (Jessor & Jessor, 1977). The latter yielded multiple correlations of .76 for males and .77 for females, almost identical in magnitude to the .75 and .76 attained in the present research.

frequency of times drunk in the past year for the problem drinkers who have not used marijuana or other illicit drugs was about "once a month." This is in contrast to the frequency of drunkenness of the marijuana users who were not problem drinkers or users of other illicit drugs; their modal response was between "once" and "two or three times" in the past year.

¹⁰Marijuana users who are not problem drinkers and who have not used any other illicit drugs constitute 38.1 per cent of the 2,744 marijuana users in the sample. Problem drinkers who have used no illicit drugs constitute 25.0 per cent of the 1,878 problem drinkers in the sample. It is of interest to note that less than 2 per cent of the marijuana users in the sample do not drink.

Table 12.3 Mean Scores of Problem Drinkers (Who Do Not Use Illicit Drugs) and of Marijuana Users (Who Are Not Problem Drinkers) on the Psychosocial Measures

Psychosocial measures	Males			Females		
	1 Problem Drinkers (n = 315)	2 Marijuana Users (n = 461)	<i>t</i> ₁ vs <i>t</i> ₂	1 Problem Drinkers (n = 154)	2 Marijuana Users (n = 585)	<i>t</i> ₁ vs <i>t</i> ₂
Personality System						
<i>Personal Instigations</i>						
Independence-Achievement Value Discrepancy	22.10	21.74	0.9	21.82	21.72	0.2
Expectations for Academic Achievement	16.42	16.96	-1.7	16.41	16.92	-1.3
<i>Personal Controls</i>						
Intolerance of Deviance	36.53	36.52	0.0	37.86	38.83	-2.0*
Religiosity	12.45	11.96	1.7	13.67	13.00	2.1*
Drinking Functions Disjunction	23.41	20.94	5.3***	22.76	18.75	7.1***
Perceived Environment System						
<i>Distal Environment</i>						
Parent-Friends Compatibility	8.77	8.89	-0.6	8.53	8.74	-0.8
Parent-Friends Influence	3.19	3.24	-0.6	3.59	3.46	1.2
<i>Proximal Environment</i>						
Family Approval of Drinking	4.02	4.05	-0.3	4.15	4.13	0.1
Friends' Approval of Drinking	3.81	3.64	2.9**	3.95	3.66	4.2***
Friends as Models for Drinking	15.55	14.55	4.5***	16.41	14.74	6.6***
Friends' Pressure for Marijuana Use	2.51	3.44	-9.5***	2.67	3.42	-6.2***
Friends as Models for Marijuana Use	7.54	10.19	-13.8***	8.39	10.78	-11.9***
Behavior System						
<i>Problem Behavior</i>						
General Deviant Behavior	20.38	19.78	1.6	18.98	18.80	0.5

(continued)

Table 12.3 (continued)

Psychosocial measures	Males			Females		
	1 Problem Drinkers (n = 315)	2 Marijuana Users (n = 461)	t_1 vs t_2	1 Problem Drinkers (n = 154)	2 Marijuana Users (n = 585)	t_1 vs t_2
<i>Conventional Behavior</i>						
Church Attendance Frequency	4.11	4.10	0.0	4.72	4.22	2.8**
School Performance	4.23	4.37	-1.3	4.71	4.77	-0.4

* $p < .05$ (two-tailed t test)** $p < .01$ *** $p < .001$

Proneness to marijuana use appears to consist of a rather coherent and integrated pattern of psychosocial attributes: *in the personality system*, greater value on independence than on academic achievement, lower expectations for academic achievement, greater tolerance of deviance, and less religiosity; *in the perceived environment system*, less compatibility between the adolescent's two major reference groups—parents and friends, less influence of parents relative to friends, and greater approval for and models for marijuana use and other problem behaviors; and *in the behavior system*, greater actual involvement in other problem behaviors and less participation in conventional activities. What gives coherence to this pattern of attributes is that all of them imply unconventionality, an orientation that is evidenced in attitudes and values, in social interactions and reference group membership, and in behavior. A review of recent psychosocial research on marijuana use (Jessor, 1979) reveals that there is quite consistent support in the literature for one or another of these attributes as correlates of youthful involvement with marijuana (Brook, Lukoff, & Whiteman, 1977; Johnston, 1973, 1974; Kandel, 1973, 1974; Sadava, 1973; Sadava and Forsyth, 1977; Smith & Fogg, 1978).

As employed in Problem Behavior Theory, the concept of *proneness* is simply a way of organizing and summarizing the theoretical propensity for engaging in problem behavior. Proneness can be specified within each system and across all of the systems—personality, the perceived environment, and behavior. The various attributes in each system may therefore be seen as risk factors, and problem-behavior proneness as a composite of the psychosocial risk for that class of behavior. It follows, then, that whatever the *particular* problem behavior of concern, the pattern of psychosocial risk should be similar, namely, a pattern of unconventionality in each of the three theoretical systems. This, indeed, is what has been found in the present study: the pattern of psychosocial proneness that effectively accounts for variation in involvement with marijuana is essentially the same pattern that distinguishes problem drinking from the non-problem use of alcohol. A similar pattern was also shown earlier to account for variation in self-reported, antisocial behavior (aggression, lying, stealing, vandalism) in the same national sample (Donovan, 1977) and

for variation in sexual experience (virginity-nonvirginity) in a longitudinal study of a local sample of adolescents (Jessor & Jessor, 1975).

Establishing a common pattern of psychosocial risk factors for adolescent problem behavior carries with it two further implications each of which has received empirical support. The first of these is that there should be some degree of covariation *among* problem behaviors, that is, engaging in any problem behavior should be associated with engaging in others as well. There is strong empirical support for this generalization in the present study as shown by the behavior system correlations in Table 12.1. There is similar support in a variety of other studies as well (Jessor, 1978, 1979; Kandel, 1978).

The second implication of establishing a common pattern of psychosocial risk is that involvement in a *specific or particular* problem behavior cannot depend on general proneness alone but must also be influenced by risk factors that are specific to that behavior. In the present study, attributes of the proximal environment were conceptualized in behavior-specific terms, e.g., friends as models for drinking and friends as models for marijuana use. Although each of the behavior-specific attributes turns out to be significantly associated with *both* problem drinking and marijuana involvement, their behavioral specificity is shown by the fact that their correlations are significantly higher for the behavior to which they specifically refer. Given the large sample in the present study, it was possible to explore this point further by locating groups that engaged in only one of these two problem behaviors and not the other. Although the psychosocial risk pattern of the two groups was generally similar, as expected, it nevertheless differed significantly on precisely the relevant behavior-specific risk factors. These findings are important because they seem to suggest that, where there is general proneness to problem behavior, what may determine the specific behavior engaged in may be the specific exposure to it, the specific support for it, or the specific models for it. In short, those risk factors that are represented in the proximal perceived environment may conceivably *channel* a general psychosocial proneness to problem behavior into the specific problem behaviors that are actually engaged in. Longitudinal research would, of course, be needed to establish the validity of these speculations.

In relation to the concept of proneness to problem behavior, it is worth emphasizing that the present results demonstrate the explanatory usefulness of all three of the theoretical systems. Although proneness in the personality system accounted for less than one-half of the variance in marijuana involvement accounted for by proneness in the perceived environment system (see Table 12.2), nevertheless the personality system contribution was always significant, and personality attributes were always among the first two or three predictors to enter the regression equation when both systems of variables were combined. As has been pointed out elsewhere, findings such as these do not necessarily suggest that environment is more important than personality in relation to problem behavior. Rather, the difference seems to be due to the fact that the measures of the perceived environment are more proximal to the particular behaviors—in fact, they actually refer to them—than are the measures of personality. That the latter relate significantly to problem behavior

despite their being distal from it is especially supportive of the theoretical framework that specified the linkage. What the present findings do indicate is the usefulness of examining both personality and environment in any explanation of adolescent problem behavior.

The observed relationship between marijuana involvement and problem drinking among American adolescents is an association that is worth particular public health attention. Our findings show not only that there is a substantial correlation between marijuana involvement and times drunk in the past year ($r = .61$ for males and $.65$ for females), but they show also that these two behaviors have similar psychosocial correlates. A recent review of the literature on adolescent problem drinking (Braucht, 1980) is consonant with this emphasis. Primary prevention, intervention, or health promotion approaches directed at adolescents need to consider the relation between these behaviors—their possible syndrome character—rather than trying to deal with them as if they were isolated, or unique, or separate kinds of action.

The conclusions that have been drawn from this study are constrained by several limitations that need mention. First, since they are based on an in-school sample of youth, the findings do not apply to those who have dropped out or who were not attending school, a segment that tends to be less conventional than those in school. Second, all of the data depend on self-reports to questionnaires, and no external, independent information could be invoked for validation purposes. Third, only a subset of variables from Problem Behavior Theory could be included in the questionnaire, so the data can represent only a partial test of its appropriateness. Fourth, there were indications that some of the measures were not effective in several of the sex-by-ethnic subsamples, and the reasons for this limitation are not explainable with the present data set.

Despite these limitations, the findings are internally consistent, they replicate across sex, age, and ethnic group boundaries, they parallel findings in related studies, and they are consonant with Problem Behavior Theory. That theory, in avoiding reliance on notions of pathology or maladjustment, has instead dealt with marijuana use in relation to a network of variables that constitute psychosocial risk for problem behavior in adolescence. These variables have been shown in the present study to be important correlates of marijuana use; in other studies (Jessor & Jessor, 1977, 1978) the same variables have also been shown to be temporal *antecedents* of marijuana use. Problem Behavior Theory thus appears to be a useful frame of reference from which to approach adolescent problem behavior, including drug and alcohol use, and the findings appear to have significant implications for public health policy.

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