A RAND NOTE

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RON D. HAYS AND PHYLLIS L. ELLICKSON[2]
The RAND Corporation

Based on three waves of data from 1261 adolescents, this study examines the nature of resistance self-efficacy vis-à-vis different drugs and social situations, as well as its relationship to perceived pressure to use drugs. We found that both self-efficacy and perceived pressure to use drugs appear to be generalizable across substances (alcohol, cigarettes, and marijuana), but adolescents do tend to distinguish between their capacity to resist drugs in different social situations. Adolescents also discriminate between how much pressure they feel and their ability to resist that pressure, but the great majority report lower levels of self-efficacy in higher pressure situations. This relationship is strongest for alcohol and weakest for marijuana. These results suggest the following implications for prevention programs: (a) adolescents can be taught to resist one or more of the commonly used drugs with a reasonable expectation that the skills will generalize to other drugs; (b) resistance self-efficacy learned in one situation can be expected to have some generalizability to other situations, but it may be important to link resistance training with a range of situations to insure the greatest effectiveness; (c) to be maximally effective, prevention programs may need to help adolescents reduce the amount of pressure experienced as well as develop resistance skills; such efforts are likely to be particularly important for situations involving alcohol.

Drug prevention programs have recently given substantial attention to helping adolescents learn how to resist or "say no" to pro-drug pressures (Dielman, Shope, Butchart, & Campanelli, 1986; Ellickson, 1984a, 1984b; Perry, Maccoby, & McAlister, 1980; Mullen, Hersey, & Iverson, 1987). Underlying this focus is the assumption, based on Bandura's (1977) theory of self-efficacy, that teenagers who learn how to resist will be more likely to believe they can do so in the future and thus more likely than those who lack such confidence to abstain from drug use. Bandura (1977, p. 193) notes that self-efficacy, the "conviction that one can successfully execute the behavior

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required to produce (certain) outcomes," affects whether an individual will try that behavior, how much effort he or she will make, and how long he or she will sustain the effort (Bandura, 1977, 1984). By extension, individuals who believe they can successfully resist or abstain from using drugs should be more likely to resist pro-drug pressures successfully than those with lower levels of resistance self-efficacy.

Studies by Bandura and others have documented the relationship between specific measures of self-efficacy and successful behavior change across a variety of behavioral domains—including phobias, pain control, smoking, dieting, exercise, and mathematical performance (Baer, Holt, & Lichtenstein, 1986; Bandura, Adams, Hardy, & Howells, 1980; Edell, Edington, Herd, O'Brien, & Witkin, 1987; Manning & Wright, 1983). This body of work supports the notion that helping adolescents avoid drugs requires teaching them resistance skills linked to actual drug pressure situations. But it is less clear how specific such training needs to be (Lawrance & McLeroy, 1986). Can training aimed at developing resistance self-efficacy be targeted at drugs in general or should it be directed at each drug separately? Are drug use resistance skills situation specific or are they generalizable across different pressure scenarios?

Existing research on the generalizability of self-efficacy provides conflicting answers. Bandura argues that self-efficacy is domain specific; it taps beliefs about being able to perform specific behaviors in particular situations (Bandura, 1986). Hence having confidence in one's ability to ride a bicycle does not necessarily imply a corresponding confidence in one's ability to drive a car. Similarly, one's perceived ability to resist the temptation to eat may vary depending on whether one is in a restaurant or in a car outside the restaurant. Bandura's work further suggests that self-efficacy perceptions about a specific behavior (such as abstaining from marijuana use) may vary with the difficulty of the task and the individual's mental state. Thus in situations where adolescents perceive high pressure to conform, their resistance self-efficacy may be lower, either because they see the task as more difficult or because anxiety inhibits performance.

In contrast, several researchers have recently suggested that self-efficacy may be generalizable across functionally related behaviors and different situations. Kirsch (1986) notes that self-efficacy scores across a wide variety of tasks reveal moderate to very high correlations, indicating that self-efficacy may generalize "as a function of the traits or abilities that are perceived as being required for successful performance" (p. 352). If this view is correct, adolescents who believe they can successfully resist pressures to smoke may also feel confident in their ability to abstain from drinking (provided they perceive strong links between the skills required for these abstinence behaviors). Others have concluded that self-efficacy vis-à-vis a specific behavior like

nonsmoking may generalize across a variety of situations—occasions when the individual feels anxious or nervous as well as those involving social pressures to smoke (DiClemente, 1986; Strecher, DeVellis, Becker, & Rosenstock, 1986).

These issues are important because of their implications for the content and efficiency of programs aimed at preventing or changing health-compromising behavior. If adolescents generalize from one substance to another, teaching them skills for resisting one or two drugs may have beneficial effects on their use of several others. If such skills are not situation specific, resistance training may be effective when linked to a few carefully chosen scenarios as opposed to an exhaustive list of situations offering cues for triggering drug use. Clarifying the relationship between resistance self-efficacy and perceived pressure to use drugs should further our understanding of the difficulty of enhancing resistance self-efficacy in high- versus low-pressure situations.

Using data from Project ALERT, a multiyear smoking and drug prevention experiment that draws on Bandura's self-efficacy research (Ellickson, 1984a; Ellickson, Bell, Thomas, Robyn, & Zellman, 1988), this study seeks to expand our understanding of the nature of drug use resistance self-efficacy and how it might be enhanced among adolescents. It addresses the following questions: (a) Is resistance self-efficacy generalizable across drugs?; (b) is it generalizable across situations?; and (c) how does it relate to the difficulty of the task? (Do adolescents distinguish between how much pressure they feel and whether they can resist it? Are they less likely to see themselves as able to resist in situations that present greater psychological difficulty?)

Method

Subjects

For the analyses presented here, we selected students in the experiment's 10 control schools. These schools, together with 20 treatment schools, were drawn from eight California and Oregon school districts in urban, suburban and rural communities. We omitted treatment students from the analysis because the experiment was designed to enhance resistance self-efficacy and thus may have altered this perception and its relationships with other constructs (Ellickson, 1984b). A test of the homogeneity of within-group covariance matrices for the control students ($n = 1261$) versus all other students with complete data ($n = 3223$) was performed for the variables included in this analysis. The chi square test for homogeneity of group covariance matrices was statistically significant (chi square $= 618.49$, dfs $= 378$, $p < .01$), indicating that separate analysis of the control students was warranted.

Students in the Project ALERT schools completed self-administered sur-

veys at six points during the experiment—at baseline and 3, 12, 15, 24 and 36 months later. The analyses reported here are based on waves 3–5, when the students were in the eighth and ninth grades. Of the 1966 students in control schools who completed a baseline survey, 1261 provided complete data on the measures analyzed here at all three data collection points.[3] In this group, 50.3% were female, 69.4% white, 11.0% Hispanic, 8.7% Black, 8.1% Asian, 2.1% American Indian, and 0.6% multiracial non-Hispanic. The average age of the respondents at baseline was 12.7 ($SD = 0.5$).

Measures

Several measures of smoking and alcohol resistance self-efficacy (RSE) exist for adults (DiClemente, 1986). However, as Lawrance and Rubinson noted in 1986, "no self-efficacy scales existed for young adolescents in the preventive behavior sphere" (p. 368). Lacking available RSE measures, we developed our own.

Project ALERT survey instruments were designed after comprehensively reviewing previous empirical and theoretical work (Ellickson et al., 1988). Appendix 1 provides the drug use RSE items developed for the study. From these items, we hypothesized three constructs at each of Waves 3–5: (a) perceived ability to resist pro-drug pressures in a date situation (Date RSE: items 1A–1C); (b) perceived ability to resist pro-drug pressure in a party situation (Party RSE: items 2B, 2D, 2F); and (c) perceived pressure to use drugs (feeling "out of it") at a party (items 2A, 2C, 2E).

In each survey, Date RSE items were separated from the perceived pressure and Party RSE items. All three of the Date RSE items appeared on the same page about two-thirds of the way through each survey. The pressure and Party RSE items appeared later in each survey, with cigarettes, marijuana, and alcohol items separated from one another and the pressure and RSE items paired next to one another for each substance.

Self-efficacy has frequently been measured by asking adult respondents if they "could" perform a target behavior and, if they could, the degree of confidence they have in being able to do it. However, our pilot test of various self-efficacy measures indicated that few adolescents will say that they could not resist pro-drug pressures. While more than 50% were willing to admit to using cigarettes, alcohol, or marijuana in the pilot tests, the great majority also reported they "could" resist. Hence we asked our young respondents what they "would" do in different situations, phrasing that is used in other studies of adolescents (Lawrance & McLeroy, 1986; Stacy, Flay, Johnson, & Hansen, 1989).

[3]The decrease in sample size is due to sample attrition (movers and absentees), refusals, and missing data for the variables included in the analysis.

We recognize that this wording opens up the possibility that our student reports include a mix of motivation (what the adolescent wants to do) and perceived competence (what he or she believes he or she is capable of doing). Therefore, we explicitly controlled for motivation in the Date RSE items: students were asked what they would do *if they didn't want to* smoke, use marijuana, or use alcohol.[4] For the party situation, we chose to distinguish between feelings of pressure to use and actual behavior, thereby allowing students to admit feeling pressure without having to admit that they would succumb. We paired the pressure and self-efficacy items because a pilot study in which item placement was manipulated indicated that reports regarding pressure and behavior were more distinct when the two questions appeared next to one another than when they were separated.

Analysis Plan

Our goals were to assess the generalizability of the RSE measures across alcohol, cigarettes, and marijuana, to evaluate the generalizability of RSE across two significant resistant situations (dates and parties), and to examine the association between perceived pressure to use drugs and RSE. To shed light on these issues, we performed a series of confirmatory analyses (multitrait scaling, multitrait-multimethod analysis, confirmatory factor analysis) and examined the correspondence between responses to the perceived pressure and Party RSE items.

Initial confirmatory analyses. Two initial confirmatory analyses were performed: multitrait scaling and multitrait-multimethod analysis. We used multitrait-scaling analysis to determine the generalizability of RSE and perceived pressure across alcohol, cigarettes, and marijuana. In this method, convergent validity is supported if the items in a scale correlate substantially with it (correlation, corrected for overlap, of 0.40). Discriminant validity is supported if each item correlates significantly more highly with its hypothesized scale than it does with other scales. Multitrait scaling was performed using the Multitrait Analysis Program (Hays, Hayashi, Carson, & Ware, 1988).

We evaluated the generalizability of RSE across *situations* using multitrait-multimethod (MTMM) analysis. MTMM analysis involves analyzing the convergent and discriminant validity of two or more traits measured by two or more methods (Campbell & Fiske, 1959). In this study, Date RSE and Party RSE are the traits and the three data waves are the methods. This application,

[4]We cannot, of course, guarantee that all adolescents heeded the conditional phrase and were able to separate motivation from competence.

a variation of the standard procedure, has been named the test-retest reliability matrix procedure (Graham et al., 1984; Graham, Hansen, & Wokenstein, 1987). Our goal was to evaluate whether measures of Date RSE at different time points correlate more highly with one another than they correlate with Party RSE (and vice versa). Because of the normal decay in test-retest correlations over time (i.e., instability), we relax the usual MTMM discriminate validity criteria to reflect the time span between measurement intervals. A microcomputer program, MTMM.EXE, was employed to conduct the MTMM analysis (Hayashi & Hays, 1987).

Confirmatory factor analysis. The multitrait scaling analysis provides information on the generalizability of RSE and pressure across drugs; the MTMM analysis addresses the generalizability of RSE across the Date and Party situations. Although these analytic methods provide pertinent information for two of the research questions addressed in this paper, each analysis looks at a separate issue. In addition, because these methods are limited to measured or observed variables, the results are influenced by errors of measurement. We used confirmatory factor analysis to examine all three research issues in the same analysis and obtain "error-free" estimates of the relationships between constructs.

We evaluated the hypothesized models' goodness-of-fit using the chi-square statistic and three measures of practical fit: rho, delta, and Bentler's "fit" index (Bentler, 1988; Bentler & Bonett, 1980). Because the likelihood of obtaining a significant chi-square increases with sample size, the practical measures of fit provide more appropriate goodness of fit tests for large samples such as the one analyzed here. These measures index the proportion of statistical information in the data that is accounted for by a model; models with practical fit values below 0.90 are generally unacceptable (Bentler & Bonett, 1980). The confirmatory factor analysis was conducted using the EQS (Bentler, 1985) computer program and the X.EXE program translator (Hays, 1988).

Correspondence of perceived pressure and party RSE. To examine the association between perceived pressure and RSE, we dichotomized the perceived pressure and resistance variables and compared perceptions of pressure with reported drug use resistance. Adolescents who selected the second or third response option in response to Items 1A–C in Appendix 1 were counted as feeling capable of resisting. For Items 2A–F, a response of *strongly disagree* was scored as low perceived pressure (items 2A, 2C, 2E) and high resistance (items 2B, 2D, 2F) at a Party, respectively. The latter choices reflect our attempt to compensate for the tendency of adolescents to overestimate their ability to resist drugs and to minimize perceptions of pressure to use them. Other cutpoints are certainly possible.

Results

Does RSE and Perceived Pressure Generalize Across Drugs?

At each of the three data points, we hypothesized three constructs (Date RSE, Party RSE, perceived pressure). Multitrait scaling supported convergent validity of each construct across the three drugs. Item-scale correlations ranged from 0.59 to 0.68 for the Date RSE items, from 0.58 to 0.73 for the Party RSE items, and from 0.67 to 0.74 for the perceived pressure items.

Discriminant validity was supported as well. Items tended to correlate significantly more highly with the hypothesized scale than with other scales, although ratings of perceived pressure and Party RSE were indistinguishable for alcohol at the latter two waves and for cigarettes at the last wave.[5] As shown in Table 1, alpha reliability coefficients (Cronbach, 1951) ranged from 0.77 to 0.85, indicating adequate reliability for group comparisons (Helmstadter, 1964). These results provide strong support for the generic nature of both resistance self-efficacy and perceived pressure across the different drugs.

Is RSE Generalizable Across Situations?

Using MTMM analysis, we examined the convergent and discriminant validity of the two resistance self-efficacy scales (Date and Party RSE). We evaluated convergent validity by calculating the average Pearson product-moment correlation among the six validity diagonals (test-retest correlations) in the MTMM matrix. The average test-retest correlation was 0.64, indicating reasonably good convergence of each RSE measure across time. However, the average correlation between Date RSE and Party RSE was 0.53, revealing considerable correlation between the two resistance situations.

To provide a specific evaluation of discriminant validity between Date RSE and Party RSE, we compared validity diagonals (i.e., test-retest correlations) with appropriate off-diagonal values. *T*-tests of the difference between dependent correlations (Steiger, 1980) indicated that 16 out of 24 (66.7%) were statistically significant in a direction supporting the discriminant validity of the measures. Given the normal decay in test-retest correlations over the one-year time lag between Wave 3 and Wave 5, these results provide considerable evidence favoring the distinctiveness of the two situations.

[5] Alcohol RSE at parties correlated as highly with perceived pressure as it did with its hypothesized scale at Wave 4; alcohol and cigarette RSE at parties correlated about as highly with perceived pressure as with their hypothesized scales at Wave 5.

Table 1

Reliability and Homogeneity Estimates For Multi-Item Scales

Scale	Mean	*SD*	Reliability	Homogeneity
Date RSE-3	4.19	1.66	0.78	0.54
Date RSE-4	4.33	1.70	0.77	0.53
Date RSE-5	4.24	1.72	0.78	0.55
Party RSE-3	5.81	2.83	0.81	0.59
Party RSE-4	6.01	2.88	0.80	0.58
Party RSE-5	6.02	2.78	0.77	0.53
Pressure-3	6.30	2.91	0.83	0.63
Pressure-4	6.43	2.97	0.85	0.65
Pressure-5	6.23	2.83	0.82	0.61

Note. All scales contain 3 items. Date RSE, Party RSE, and Pressure represent the following: a) resistance self-efficacy in a date situation; b) resistance self-efficacy in a party situation; and c) perceived pressure to use drugs. The survey wave from which the items were drawn is represented by number (e.g., Date RSE-3 = Date RSE at wave 3). Reliability is Cronbach's (1951) reliability coefficient. Homogeneity is the estimated reliability of a single item.

Structural Model of RSE and Perceived Pressure

The analyses conducted thus far suggest that RSE and perceived pressure generalize across alcohol, cigarettes, and marijuana, and that Date RSE and Party RSE are distinct, yet correlated. To provide an integrated test of these two issues and to examine the relationship between perceived pressure and the resistance self-efficacy measures, we performed a confirmatory factor analysis of Date RSE, Party RSE, and perceived pressure to use drugs. In this analysis, 27 indicator variables (3 constructs × 3 drugs × 3 time points) defined nine latent variables: Date RSE, Party RSE, and perceived pressure at Waves 3–5.

The 27 indicators were significantly kurtose, with univariate kurtosis ranging from −1.57 to 3.19 and Mardia's (1970) normalized coefficient of multivariate kurtosis equal to 138.50. Because of the potential problems with using maximum likelihood estimation for data that deviates from multivariate normality, we checked maximum likelihood results with asymptotically distribution free estimates. Results of this analysis and previous research (e.g., Huba & Harlow, 1987) suggest that maximum likelihood estimates are robust.[6]

[6]Asymptotically distribution free estimation provided results that were consistent with the ML results; therefore, they are not reported here.

We specified an initial confirmatory factor analytic model (Model 1) that allowed the nine latent variables to be freely intercorrelated, but did not permit correlated errors. As Table 2 shows, maximum likelihood estimation indicated that Model 1 was rejectable on both statistical and practical grounds. Using Lagrange multiplier modification indices (Bentler & Chou, 1986), we identified correlated uniqueness terms that could be added to improve model fit. We added these parameter estimates until a model with acceptable practical fit was obtained (delta = 0.95, rho = 0.95, FI = 0.96). All of the parameter estimates in this model were statistically significant; in addition, the Wald test suggested that no parameters should be dropped.[7]

Table 3 presents the final model's parameter estimates for indicator loadings on the nine constructs. The substantial magnitude of these parameters, ranging from 0.67 to 0.92, provides considerable support for the convergent validity of Date RSE, Party RSE, and perceived pressure across different drugs.

Table 4 gives the estimated correlations between the nine latent variables. These correlations, which range from 0.40 to 0.85 (16% to 72% shared or common variance), provide support for the discriminant validity of the constructs. Date and Party RSE had notable correlations with one another, ranging from 0.66 to 0.73. But the correlations are also significantly smaller than unity, suggesting that resistance self-efficacy is situationally dependent.

Similar results show up when comparing resistance self-efficacy and perceived pressure. A strong relationship between the two concepts is illustrated by correlations ranging from 0.70 to 0.75 between pressure and Party RSE and from 0.55 to 0.58 between pressure and Date RSE. The magnitude of

Table 2

Goodness-of-Fit of Structural Equation Models

Model	*df*	chi-square	delta	rho	FI
1. Initial 9-Factor confirmatory model	288	7249.31	.729	.679	.737
2. Final model, adding 50 correlated errors	238	1199.28	.955	.946	.964

Note. Maximum likelihood results are shown. FI = Bentler's (1988) "fit" index. Asymptotically distribution free results, although not reported, were very similar. All p's $< .01$.

[7]The correlation between corresponding estimates for the initial and final models was 0.93, indicating that adding the correlated uniqueness terms did not affect substantially the initial model.

Table 3

Measurement Model Parameter Estimates: Indicators of Nine Latent Variables (Final Model)

	Date			Party			Pressure		
	RSE-3	RSE-4	RSE-5	RSE-3	RSE-4	RSE-5	3	4	5
ALC	0.67								
CIG	0.86								
MAR	0.74								
ALC		0.69							
CIG		0.83							
MAR		0.74							
ALC			0.67						
CIG			0.80						
MAR			0.79						
ALC				0.70					
CIG				0.92					
MAR				0.71					
ALC					0.68				
CIG					0.88				
MAR					0.73				
ALC						0.69			
CIG						0.78			
MAR						0.72			
ALC							0.78		
CIG							0.86		
MAR							0.76		
ALC								0.77	
CIG								0.87	
MAR								0.79	
ALC									0.78
CIG									0.79
MAR									0.80

Note. Maximum likelihood parameter estimates are shown. Asymptotically distribution free estimates, although not reported, were very similar. See Table 1 for description of column entries. ALC = Alcohol, CIG = Cigarettes, MAR = Marijuana.

Table 4

Estimated Correlations Among Nine Latent Variables (Final Model)

Variable	Date			Party			Pressure		
	RSE-3	RSE-4	RSE-5	RSE-3	RSE-4	RSE-5	3	4	5
Date RSE-3	1.00								
Date RSE-4	0.77	1.00							
Date RSE-5	0.57	0.67	1.00						
Party RSE-3	0.73+	0.65	0.42	1.00					
Party RSE-4	0.66	0.72+	0.46	0.85	1.00				
Party RSE-5	0.57	0.62	0.66+	0.67	0.73	1.00			
Pressure-3	0.54+	0.56	0.40	0.70+	0.66	0.53	1.00		
Pressure-4	0.51	0.58+	0.46	0.62	0.75+	0.60	0.78	1.00	
Pressure-5	0.41	0.49	0.58+	0.48	0.54	0.74+	0.64	0.71	1.00

Note. Maximum likelihood parameter estimates are shown. Asymptotically distribution free estimates, although not reported, were very similar. Coefficients followed by a plus sign represent correlations among hypothesized distinct constructs measured at the same wave. See Table 1 for description of column entries.

these correlations indicates that pressure and resistance self-efficacy are distinct (i.e., correlations are less than unity), but highly related concepts.

How does RSE Relate to Perceived Pressure to Use Drugs?

The confirmatory factor analyses provide evidence that perceived pressure to use drugs is distinct from perceptions of being able to resist them. These findings support Bandura's contention that self-efficacy is distinguishable from the individual's mental state and/or perception of task difficulty. Nevertheless, the two constructs are clearly related, indicating that adolescents who feel greater pressure in social situations where others are using also report lower levels of resistance self-efficacy. To further explore the relationship between difficulty of the task and RSE, we examined the correspondence of the dichotomized versions of perceived pressure and RSE for each substance separately (see Table 5).

Of those who reported they would feel pressure to use cigarettes, alcohol, or

Table 5

Correspondence Between Perceived Pressure and Resistance Self-Efficacy

Substance	Percent of those who perceive pressure with low resistance		
	Wave 3	Wave 4	Wave 5
Alcohol	86.4	89.2	89.8
Cigarettes	71.3	75.5	74.0
Marijuana	62.0	68.7	69.4
Substance	**Percent of those with low resistance that perceive pressure**		
	Wave 3	Wave 4	Wave 5
Alcohol	89.0	91.2	89.5
Cigarettes	89.2	91.0	87.1
Marijuana	87.7	90.2	85.8

Note. We classified a response of *2* or *3* for Items IA–C in Appendix 1 as indicating resistance on dates. For Items 2A–F we classified a response of *4* (*strongly disagree*) as low perceived pressure and resistance at a Party, respectively. All between substance differences withen each wave in the top panel are statistically significant ($p < 0.01$). In the bottom panel, Wave 5 perceptions about cigarettes differ significantly from alcohol and marijuana ($p < 0.01$).

marijuana if "all my friends were using" the substance at a party, an average of 78% (across all three waves and substances) said they would use on a date and/or at a party (low resistance). Conversely, when a student thought he or she would use in one and/or the other situation, he or she reported that he or she would feel pressure when all his friends were using about 89% of the time.[8]

As Table 5 shows, however, there are notable differences across the three substances. The relationship between perceived pressure and lower resistance self-efficacy is strongest for alcohol and weakest for marijuana: in Grade 9 (Wave 5), 10% thought they would resist alcohol even if they felt pressure to drink, whereas 31% thought they could abstain from marijuana use under the same conditions. Indeed, students who perceived pressure to use alcohol and marijuana were significantly more likely to think they could resist marijuana than alcohol ($t(509) = 10.90$, $p < 0.01$). In Grade 8 (Waves 3 & 4), the differences were similar. Pressure to use cigarettes occupies an intermediate position, with approximately 15% more students reporting ability to resist cigarettes than alcohol when they feel pressure to use. This particular pattern across drugs also appears in Table 6, which indicates substantially higher rates of perceived pressure to use alcohol than to use cigarettes or marijuana. Hence prevention programs seeking to enhance young people's ability to resist drugs may face a more difficult challenge with respect to alcohol than other substances.

Discussion

Both resistance self-efficacy and perceived pressure to use drugs appear to be generalizable across alcohol, cigarettes, and marijuana. The scales tapping

Table 6

Rates of Students' Perceived Pressure and Low Resistance

Substance	Pressure			Low resistance		
	Wave 3	Wave 4	Wave 5	Wave 3	Wave 4	Wave 5
Alcohol	64.0	66.4	66.7	62.1	64.9	66.9
Cigarettes	58.8	59.2	55.2	47.0	49.2	46.9
Marijuana	43.0	42.3	42.3	30.4	32.3	34.2

Note. See Table 5 for explanation of dichotomous scoring. At each wave, the between substance differences are statistically significant ($p < 0.01$).

[8]As one would predict from the large correlations between perceived pressure and resistance self-efficacy, the majority of students who reported low pressure also reported high resistance (and vice versa).

perceptions of pressure, Date RSE, and Party RSE for alcohol, cigarettes, and marijuana were internally consistent, with alpha reliabilities of about 0.80. In addition, the indicator loadings for different drugs in the latent variable model were large and similar in magnitude.

These results suggest that one can teach adolescents how to resist one or more of the commonly used drugs (alcohol, cigarettes, and marijuana) with a reasonable expectation that their enhanced resistance skills and perceived ability to resist will generalize to other substances. This finding is encouraging because of its implications for prevention efficiency. It is also compatible with suggestions that prevention be directed at drug use as a class of related behaviors rather than concentrating solely on a single substance (McAlister, Perry, Killen, Slinkard, & Maccoby, 1980). Furthermore, it is consistent with previous research that has shown alcohol, cigarettes, marijuana, and "hard" drugs to form a common factor of drug use (Hays, Stacy, & DiMatteo, 1984; Hays, Widaman, DiMatteo, & Stacy, 1987).

Our findings indicate that adolescents do make distinctions between how much pressure they feel and their ability to resist that pressure; some adolescents report that they would not use a drug even though they perceive high pressure in that situation; others report that they would use a drug even if they perceive little pressure. Nevertheless, the great majority report lower self-efficacy when they experience pressure to conform. The results presented here show the strongest probability of use in relation to pressure for alcohol, whereas the linkage between pressure and resistance self-efficacy is weakest for marijuana. About 9 out of 10 students who reported feeling pressure to use alcohol also reported that they would probably use it on a date or at a party; for marijuana, about 7 out of 10 students who perceived pressure reported that they would use in one or both of these situations.

These results suggest that adolescents experience more pressure to use alcohol in social situations where others are drinking compared to using marijuana or tobacco and find it correspondingly more difficult to abstain when involved in social drinking environments. The findings are consistent with the high levels of societal acceptance and reinforcement of alcohol use in the United States. Considerably more high school seniors report current drinking (64%) than current marijuana or tobacco use (between 18 and 29%); considerably fewer disapprove of trying one or two drinks than disapprove of trying marijuana or cigarettes once or twice (Johnston, O'Malley, & Bachman, 1989). Hence normative levels of use and approval may influence the adolescent's perceived ability to resist above and beyond the context of the particular situation and dilute the generalizability of resistance self-efficacy across different drugs. In particular, successfully increasing resistance self-efficacy vis-à-vis alcohol may be more difficult and thus require greater prevention input than doing so for other substances.

The strong inverse relationship between perceived pressure and resistance self-efficacy also suggests that prevention programs should help adolescents legitimize the alternative of avoiding high pressure situations, make sharper distinctions between feeling pressure to use drugs and what they can do about it, and learn how to reduce the degree of pressure experienced. Such pressure is all too often a fact of life for young people; avoiding parties or other situations in which one knows drugs will be available is a solution for which adolescents need considerable support. In addition, validating their perceptions that these pressures are real, while demonstrating how people like themselves have successfully resisted may help young people view the task as less difficult or anxiety producing. Helping them understand how they put pressure on themselves even when no one specifically offers them drugs may also reduce the degree of pressure experienced: Some programs seek to achieve this result by showing young people that contrary to their own beliefs, most of their peers do not use drugs; others add activities designed to help adolescents identify and resist internal, as well as external, pressure (Ellickson, 1984a; Ellickson et al., 1988; McAlister et al., 1980).

Perceptions of resistance self-efficacy for the two social situations examined here were distinguishable, yet substantially correlated with one another. That is, if an adolescent can resist at a party where others are using, he or she is more likely to believe he or she can resist on a date and vice versa. Nevertheless, student's Date versus Party RSE perceptions were distinct. Across waves, the average correlation between resistance self-efficacy ratings in these two situations was 0.53. Estimated correlations between the resistance self-efficacy latent variables measured at the same wave ranged from 0.66 to 0.73.

These results are consistent with the notion that Date and Party resistance are functionally similar behaviors, but that resistance self-efficacy skills in these two situations are somewhat different, perhaps varying with the number of persons involved, whether the situation involves others of the same or opposite sex, or even the age and sociability of the student. Hence, while resistance self-efficacy learned in one situation can be expected to have some generalizability to other situations, it may be important to link resistance training with a range of situations to insure the greatest effectiveness. Considerably more research is needed to pinpoint the social situations that call for specific attention and to clarify the extent to which particular characteristics of the individual interact with these situations to produce different levels of resistance self-efficacy. Future research is also necessary to address the question of whether resistance self-efficacy in social situations generalizes to solitary contexts for adolescents, especially those in which negative affect such as depression, loneliness, and low self-esteem are experienced (DiClemente, 1986).

The moderate relationship we observed between Party RSE and Date RSE differs from the results of much previous research: "one limitation of efficacy theory as operationalized . . . is that efficacy beliefs are not specific to particular situations as many researchers (including ourselves) have hoped" (Baer et al., 1986, p. 850). The distinction between the two situations may be attributable in part to differences in this study's assessment methods compared to those used in other research. Most self-efficacy measures ask respondents to indicate their degree of confidence in being able to perform a behavior in various situations. The structure of such measures maximizes the potential for methodological effect; by blocking a long list of situations together under a common response format, perceptions of self-efficacy in different situations may be blurred. Our method, in contrast, maximizes the possibility for distinctiveness by using different response options for the two situations and separating the Date and Party questions from one another in the survey.

While we believe the situational distinction observed here taps differences that exist over and above differences in methods, this is clearly a question for further research. To best address the issue of the generality of resistance self-efficacy across situations, we recommend the use of similar response options for different situations, but noncontiguous placement of the questions within the survey.

References

Baer, J. S., Holt, C. S., & Lichtenstein, E. (1986). Self-efficacy and smoking reexamined: Construct validity and clinical utility. *Journal of Consulting and Clinical Psychology,* **54**, 846–852.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychological Review,* **84**, 191–215.

Bandura, A. (1984). Social learning theory. In N. Maccoby, C. L. Albright, J. W. Farquhar, G. R. Elliott, C. B. Taylor, & A. Mortimer (eds.), *Conference report: Unhealthful risk-taking behaviors in adolescence* (pp. 17–22). Stanford University: Carnegie Corporation of New York.

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology, 4*, 359–373.

Bandura, A., Adams, N. E., Hardy, A. B., & Howells, G. N. (1980). Tests of the generality of self-efficacy theory. *Cognitive Therapy and Research,* **4**, 39–66.

Bentler, P. M. (1985). *Theory and implementation of EOS: A structural equations program.* Los Angeles: BMDP Statistical Software.

Bentler, P. M. (1988, September). *Comparative fit indexes in structural models.* UCLA Statistics Series #9, Los Angeles, CA.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin,* **88**, 588–606.

Bentler, P. M., & Chou, C. P. (1986, April). *Statistics for parameter expansion and construction in structural models.* Paper presented at the meeting of the American Educational Research Association, San Francisco.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validity by the multitrait-multimethod matrix. *Psychological Bulletin,* **56**, 81–105.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika,* **16**, 297–334.

DiClemente, C. C. (1986). Self-efficacy and the addictive behaviors. *Journal of Social and Clinical Psychology,* **4**, 302–315.

Dielman, T. E., Shope, J. T., Butchart, A. T., & Campanelli, P. C. (1986). Prevention of adolescent alcohol misuse: An elementary school program. *Journal of Pediatric Psychology,* **11**, 259–282.

Edell, B. H., Edington, S., Herd, B., O'Brien, P. M., & Witkin, G. (1987). Self-efficacy and self-motivation as predictors of weight loss. *Addictive Behaviors,* **12**, 63–66.

Ellickson, P. L. (1984a). *Project ALERT: A smoking and drug prevention experiment: First-year progress report.* Santa Monica, CA: The RAND Corporation, N-2184-CHF.

Ellickson, P. L. (1984b). *Designing an effective prevention program: Principles underlying the RAND smoking and drug prevention experiment.* Santa Monica, CA: The RAND Corporation, P-7068.

Ellickson, P. L., Bell, R. M., Thomas, M. A., Robyn, A. E., & Zellman, G. (1988). *Designing and implementing Project ALERT: A smoking and drug prevention experiment.* Santa Monica, CA: The RAND Corporation, R-3754-CHF.

Graham, J. W., Flay, B. R., Johnson, C. A., Hansen, W. B., Grossman, L., & Sobel, J. L. (1984). Reliability of self-report measures of drug use in prevention research: Evaluation of the Project SMART questionnaire via the test-retest reliability matrix. *Journal of Drug Education,* **14**, 175–193.

Graham, J. W., Hansen, W. B., & Wolkenstein, B. (1987, April). Applying the test-retest reliability matrix to Project ADAPT questionnaire. In R. D. Hays (Chair), *Old and new strategies for analyzing multitrait-multimethod matrices.* Symposium conducted at the meeting of the Western Psychological Association, Long Beach, CA.

Hayashi, T., & Hays, R. D. (1987). A microcomputer program for analyzing multitrait-multimethod matrices. *Behavior Research Methods, Instruments, and Computers,* **19**, 345–348.

Hays, R. D. (1988). X.EXE: A program for simplifying EQS input. *Applied Psychological Measurement,* **12**, 322.

Hays, R. D., Hayashi, T., Carson, S., & Ware, J. E. (1988). *The Multitrait Analysis Program (MAP) user's guide.* Santa Monica, CA: The RAND Corporation, N-2786-RC.

Hays, R., Stacy, A. W., & DiMatteo, M. R. (1984). Covariation among health-related behaviors. *Addictive Behaviors,* **9**, 315–318.

Hays, R. D., Widaman, K. F., DiMatteo, M. R., & Stacy, A. W. (1987). Structural equation models of current drug use: Are appropriate models so simple (x)? *Journal of Personality and Social Psychology,* **52**, 134–144.

Helmstadter, G. C. (1964). *Principles of psychological measurement.* New York: Appleton-Century-Crofts.

Huba, G. J., & Harlow, L. L. (1987). Robust structural equation models: Implications for developmental psychology. *Child Development,* **58**, 147–166.

Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (1989). *Drug use, drinking, and smoking: National survey results from high school, college, and young adult populations, 1975–1988.* Rockville, MD: National Institute on Drug Abuse.

Kirsch, I. (1986). Early research on self-efficacy: What we already know without knowing we know. *Journal of Social and Clinical Psychology,* **4**, 339–358.

Lawrance, L., & McLeroy, K. R. (1986). Self-efficacy and health education. *Journal of School Health,* **56**, 317–321.

Lawrance, L., & Rubinson, L. (1986). Self-efficacy as a predictor of smoking behavior in young adolescents. *Addictive Behaviors,* **11**, 367–382.

Manning, M. M., & Wright, T. L. (1983). Self-efficacy expectancies, outcome expectancies, and the persistence of pain control in childbirth. *Journal of Personality and Social Psychology,* **45**, 421–431.

Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis. *Biometrika,* **57**, 519–530.

McAlister, A., Perry, C., Killen, J., Slinkard, L. A., & Maccoby, N. (1980). Pilot study of smoking, alcohol and drug abuse prevention. *American Journal of Public Health,* **70**, 719–721.

Mullen, P. D., Hersey, J. L., & Iverson, D. C. (1987). Health behavior models compared. *Social Science and Medicine,* **24**, 973–981.

Perry, C., Maccoby, N., & McAlister, A. (1980). Modifying smoking behavior of teenagers: A school-based intervention. *American Journal of Public Health,* **70**, 722–725.

Stacy, A. W., Flay, B. R., Johnson, C. A., & Hansen, W. B. (1989). *A comparison of informational, normative, and individual difference factors as longitudinal predictors of adolescent smoking.* Manuscript submitted for publication.

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin,* **87**, 245–251.

Strecher, V. J., DeVellis, B. M., Becker, M. H., & Rosenstock, I. M. (1986). The role of self-efficacy in achieving health behavior change. *Health Education Quarterly,* **13**, 73–91.

Appendix 1

Resistance and Pressure Items Included in Waves 3–5 Surveys

1. Here is a situation that kids sometimes find themselves in. Please read it and then answer the questions below.

YOU'RE ON A DATE WITH A PERSON YOU REALLY LIKE. YOUR DATE TAKES OUT A CIGARETTE AND ASKS IF YOU WANT ONE.

A. What would you most likely do in this situation if you *didn't* want to smoke? [DATE RSE]

(Circle One Answer)

I would take the cigarette and smoke it 1
I would say "Not now, maybe some other time" ..... 2 *
I would tell my date "No" and *not* smoke it ..... 3 *

B. What if your date offered you some *pot* and you did *not* want it. What would you do? [DATE RSE]

(Circle One Answer)

I would take the pot and smoke it 1
I would say "Not now, maybe some other time" ..... 2 *
I would tell my date "no" and *not* smoke it ..... 3 *

C. What if your date offered you a *beer* and you did *not* want it. What would you do? [DATE RSE]

(Circle One Answer)

I would take the beer and drink it 1
I would take the beer and *not* drink it ..... 2 *
I would tell my date "No" and *not* drink it ..... 3 *

2. How strongly do you AGREE or DISAGREE with these statements?

A. If all my friends were smoking cigarettes at a party, I'd feel pretty out of it unless I smoked too. [PARTY PRESSURE]

Strongly agree 1
Sort of agree 2
Sort of disagree 3
Strongly disagree ..... 4 **

B. If all my friends were smoking cigarettes at a party, I would probably smoke too. [PARTY RSE]

Strongly agree 1
Sort of agree 2
Sort of disagree 3
Strongly disagree . . . . . 4 ***

C. If all my friends were using marijuana at a party, I'd feel pretty out of it unless I used it too. [MARIJUANA PRESSURE]

Strongly agree 1
Sort of agree 2
Sort of disagree 3
Strongly disagree . . . . . 4 **

D. If all my friends were using marijuana at a party, I would probably use it too. [MARIJUANA RSE]

Strongly agree 1
Sort of agree 2
Sort of disagree 3
Strongly disagree . . . . . 4 ***

E. If all my friends were drinking alcohol at a party, I'd feel pretty out of it unless I drank too. [ALOCHOL PRESSURE]

Strongly agree 1
Sort of agree 2
Sort of disagree 3
Strongly disagree . . . . . 4 **

F. If all my friends were drinking alcohol at a party, I would probably drink too. [ALCOHOL RSE]

Strongly agree 1
Sort of agree 2
Sort of disagree 3
Strongly disagree . . . . . 4 ***

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*Response counted as Date RSE in analysis of correspondence of perceived pressure and RSE.

**Responses counted as low perceived pressure.

***Response counted as Party RSE.