

Attitude-Social Support Interactions: Contingent Consistency Effects in the Prediction of Adolescent Smoking, Drinking, and Drug Use*

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We tested an interactive model of attitudes and perceived social support in a panel survey of substance use among Irish postprimary students. We hypothesized that contingent consistency interactions would be more likely 1) for perceived social support from friends than from parents: 2) for perceived substance use by others than for verbal support: 3) in predicting change than in predicting current substance use: 4) for younger than for older adolescents: and 5) for drug use than for drinking and smoking. Contrary to predictions, we found significant contingent consistency interactions for all three behaviors and regardless of the age of the students. These interactions were more likely when predicting current behavior rather than behavior change. The significant interactions primarily involved perceived substance use by friends. Increased accessibility, selective friendship choices, and rationalization processes are possible explanations for the findings.

Most contemporary attitude theories recognize explicitly the importance of perceived social support for behavior and incorporate normative beliefs or similar constructs to represent such influences (e.g., Ajzen and Fishbein 1980; Bagozzi 1982; Triandis 1980). These theories, however, assume routinely that attitudes and perceived social support are independent of one another and are additive. In fact, the effects of these variables may be interdependent and interactive in some situations. Specifically, it has been suggested that a relationship of *contingent consistency* may exist, such that an attitude will be expressed behaviorally only when it is seen to be supported by a favorable environment (cf. Andrews and Kandel 1979; Grube, Morgan and McGee 1986; Liska 1984). In the present paper we investigate the extent to which an interactive model of attitudes and perceived social support increases the prediction of adolescent smoking, drinking, and other drug use above and beyond an additive model. In addition, we consider potential determinants of when such interactions will occur.

Although the contingent consistency hypothesis is intuitively appealing, the extant research is inconclusive. Many of the early studies reporting attitude-social support interactions (e.g., Acock and DeFleur 1972; Fendrich 1967; Liska 1974; Warner and DeFleur 1969) have been criticized on methodological and substantive grounds. It has been noted that the designs and analyses used in these studies often were inappropriate for testing the contingent consistency hypothesis: moreover, the reported interactions frequently were statistically non-significant and quite small, often accounting for less than 1 percent of the variance in the target behavior (cf., Schuman and Johnson 1976; Susmilch, Elliot, and Schwanz 1975). Many of these studies also are deficient on measurement grounds, failing to deal adequately with issues of correspondence and specificity of the attitude, social support, and behavioral measures.

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Among more recent studies, contingent consistency interactions have been obtained in some cases but not in others. Thus, significant interactions were found in predicting marijuana use among young adolescents (Andrews and Kandel 1979), in predicting drinking among adults (Rabow, Neuman, and Hernandez 1987), and in predicting smoking among grade school and college students (Grube et al. 1986). Significant contingent consistency effects were not found, however, in predicting soft drink or dress choices among college students (Bagozzi and Schnedlitz 1985) or marijuana use among older adolescents (Andrews and Kandel 1979).

At least four theoretical explications of the conditions necessary for contingent consistency effects can be offered. First, Andrews and Kandel (1979) proposed that social support, in addition to a supportive attitude, is a necessary condition for behaviors that are novel or in transition. This hypothesis, they suggested, was consistent with the fact that they found significant contingent consistency interactions when predicting marijuana use by younger but not by older adolescents. This interpretation, however, cannot account for significant contingent consistency interactions that have been found for ongoing legal behaviors such as drinking by adults (Rabow et al., 1987) and smoking by college students (Grube et al. 1986). Nonetheless, this hypothesis deserves further consideration. It is widely accepted and is cited frequently in the substance use and attitude literature (e.g., Liska 1984). Moreover, even though such interactions have been found for licit and current behaviors among adults, different processes may influence the attitude-behavior relationship in adolescents. Thus, in keeping with Andrews and Kandel (1979), we predicted that contingent consistency interactions would be found in predicting smoking, drinking, and drug use for younger but not for older adolescents. We predicted further that contingent consistency effects would be found in predicting change in smoking, drinking, and drug use, but not in predicting current behavior. This latter prediction is based on the assumption that cross-sectional measures of current substance use include a combination of abstainers, newly initiated users, and longer-term users. If Andrews and Kandel (1979) are correct, contingent consistency interactions should be found only among the relatively small group of newly initiated users. As a result, these effects would be masked when current drug use behaviors are predicted for a combined sample.

Second, we propose that contingent consistency effects among adolescents are more likely when the target behavior has a high probability of entailing social or personal costs and when those costs are potentially large. Under these circumstances an individual will act upon a favorable attitude only if there is a reasonable certainty then the behavior in question will not be disapproved by personally significant referents. Behaviors that are illegal, widely disapproved or generally perceived as deviant should be more likely than other behaviors to show contingent consistency effects. Thus behaviors such as soft drink and dress choices, which entail little social risk, should not show contingent consistency effects. On this basis we expected that contingent consistency effects would be more likely for drug use and less likely for smoking and drinking.

Finally, two additional factors may be important in determining when contingent consistency effects occur: 1) the importance of the referents who are the targets of the beliefs about social support and 2) whether these beliefs focus on the behavior or verbal exhortations of others. In the first instance, the fact that significant contingent consistency interactions were not found in some students may be attributable to a failure to take into account the salience of various reference groups in measuring perceived social support. Most studies combined measures across referents or used generalized measures. Among adolescents, the distinction between friends and others may be especially relevant. Friends may be more immediately important as sources of social reinforcement than parents, other adults, or other peers. As a result, beliefs about friends may be more likely than beliefs about other referents to be involved in contingent consistency effects. Some support for this hypothesis is provided by at least one of the previous studies (Grube et al. 1986) in which it was noted that the significant contingent consistency interactions found in predicting smoking almost always involved beliefs about friends, whereas beliefs about parents were implicated only rarely in such interactions.

In the second instance, the failure to find substantively meaningful interactions may be a result of limitations in conceptualising perceived social support in many of the available studies. Most of these studies focus only on perceived approval or disapproval of others (e.g., Bagozzi and Schnedlitz 1985) or else combine measures of perceived approval-disapproval and behavior of others into a single indicator (Rabow et al. 1987). We propose here that beliefs about the behaviors of others may be more important for contingent consistency interactions than are beliefs about others' verbal approval or disapproval. Overt actions may convey more information than verbal prescriptions or proscriptions about what is acceptable or desirable, especially when cues regarding appropriate behavior are ambiguous or conflicting. Consistent with this assertion, there is evidence that behavioural modelling may be more important than verbal exhortations for eliciting behavior (e.g., Bryan and Walbek 1970). Perceptions of the behaviors of others, and especially of friends, are found routinely to be among the best predictors of adolescent smoking, drinking, and drug use (e.g., Chassin 1984). These beliefs appear to be far more important in this regard than are perceptions of approval or disapproval.

Availability or opportunity also may be a factor in contingent consistency interactions. An adolescent may have favourable attitudes towards tobacco, alcohol, or drug use, but cannot act upon these attitudes because of lack of opportunity or limited access. Having a friend or a parent who smokes, drinks, or uses drugs may increase a young person's opportunities for obtaining and using these substances and thus may increase the relationship between attitude and behavior. In the case of adults, behaviors such as drinking are most likely to occur in social situations. Having friends or acquaintances who drink may place an individual more often in situations where alcohol is consumed.

In sum, we hypothesized that contingent consistency interactions would be more likely 1) for beliefs about friends than about parents; 2) for beliefs about the behaviors of others than about the approval or disapproval of others; 3) when predicting change than when predicting current behaviors; 4) among younger as opposed to older adolescents; and (5) for drug use than for smoking and drinking. We investigated these hypotheses using panel survey data concerning smoking, drinking and drug use obtained from postprimary students in Dublin, Ireland.

METHOD

Procedures

Overview: We collected data on three occasions over a one-year period, using anonymous, self-administered surveys and a self-generated identification code to match questionnaires across the data collection phases (Grube, Morgan, and Kearney 1989; Kearney, Hopkins, Mauss, and Weisheit 1984). The questionnaire at first phase (February 1984) focused on beliefs, attitudes and behaviors relating to cigarette smoking; the questionnaire at the second phase (March 1984) focused on alcohol and drugs. The final phase (March 1985) focused on smoking, drinking, and drug use behaviors. For the purposes of this paper, Phases I and II were combined into a single baseline measurement point.

Subjects: The target population for the surveys consisted of postprimary students within the greater Dublin, Ireland area. For each class level a sample of schools was obtained and stratified for gender composition, size, and type of school (secondary, comprehensive/community or vocational).¹ In all, 24 schools were selected thus and participated in the research. Within each school all students from the predetermined class level were considered eligible for inclusion in the study.

¹ Irish postprimary schools approximate Grades 8 through 12 in American school systems. They grant two types of degrees by examination: an intermediate certificate after three years of schooling and a leaving certificate after five years. Secondary schools focus on an academic curriculum and are state-subsidized private institutions. They are operated by religious orders or an independent board of governors. Vocational schools are similar to secondary schools in structure, but place more emphasis on non-academic subjects and technical training. Comprehensive and community schools are operated by local boards and combine academic and technical training.

We obtained data from 2,927 students at first phase of the study and 2,782 students at the second phase, representing an average of 90 percent of the eligible students enrolled in the participating schools at the time.² At the third phase, school leavers and graduated students were dropped from the study and one school refused further participation. Thus we obtained data for only 1,851 students. The respondents were divided nearly evenly between males (50.1%) and females (49.9%). They ranged in age from about 10 to 21 years old, but the great majority (99.7%) fell between 12 and 18 years. The median age at the first phase was 15.3 years.

Survey administration. We arranged with the participating schools for all students in the selected class levels to be tested in their regular classrooms or in another group setting within the school. The survey sessions were supervised by trained research personnel and lasted about 40 to 50 minutes. Before each session, a member of the research staff explained that the study was concerned with smoking, drinking, and drug use, and assured the students as to the complete anonymity and confidentiality of their responses. The students were told *not* to put their names anywhere on the survey materials; the need for truthful answers was emphasized. These verbal instructions were reiterated on the inside cover of the questionnaire. Previous research suggests that conditions of anonymity and confidentiality can lead to responses that are as reliable and valid as those obtained with more cumbersome techniques, such as the bogus pipeline or the randomized response (Akers, Massey, Clarke, and Laver 1983; Hansen, Malotte, and Fielding 1985; Murray and Perry 1987).

Matching Procedure

Because the questionnaires were administered anonymously, they were linked across the phases with a self-generated identification code using an off-one procedure to compensate for respondents' errors (Grube et al. 1989; Keamey et al. 1984). This code comprised seven elements: gender, day, month, and year of birth, number of older brothers, number of older sisters, and initial of mother's first name. School and class level also were used in the matching process. Approximately 88 percent of possible matches were made between the two baseline sessions and 73 percent of possible matches were made between the baseline and the final session. Analyses regarding the differences between matched and unmatched respondents are reported in detail elsewhere (Grube et al. 1989; Morgan and Grube, forthcoming). In general, respondents unmatched or otherwise lost to the study were significantly more likely to report smoking, drinking, and drug use and to have more favorable attitudes toward these behaviors. Females were more likely than males to be retained, as were younger students. These differences generally were small, however, and matching status accounted on the average for only 1 to 2 percent of the variance in these variables.

Measures

Smoking, drinking, and drug use. Smoking was measured by asking the students to indicate on an eight-point scale how many cigarettes (none-more than 20) they smoked, on the average, each day during the month before the survey. Drinking was ascertained similarly with a series of seven-point scales that asked the students how many times (none-more than 10) they had taken a whole drink of cider, beer, wine, or spirits during the previous month. We calculated an index of drinking behavior by taking the mean of these items ($\alpha = .73$). Finally, we measured drug use with a similar series of scales asking the students how often they had used each of nine drugs (inhalants, marijuana, cocaine, heroin, LSD, barbiturates, speed, psilocybin, cough syrup) to get high during the past month. They also were asked whether they had used any other drugs not included on the list and to specify what these were. We calculated an index of this behavior by

²The somewhat higher absentee rate at the second session appears to be due to the fact that data collection preceded a school holiday.

summing the number of different drugs each student reported using ($\alpha = .78$). Simple summated measures such as these have been shown to perform as well or better than more complicated stage scores or quantity-frequency indices (e.g., Needle, Su, and Lavee 1989).

Attitudes. We measured attitudes toward smoking, drinking, and drug use with five-point scales. For smoking, three items were included in these scales (pleasant-unpleasant, enjoyable-unenjoyable, like-dislike). Only two items were used for measuring attitudes toward drinking and drug use (pleasant-unpleasant, like-dislike). In each case the items were personalized and targeted specifically at the respondents' own behavior (e.g., "Do you think smoking cigarettes would be a pleasant thing for you to do, or an unpleasant thing for you to do?"). The internal reliabilities for these measures ranged from .76 for drug use attitude to .86 for attitudes toward both smoking and drinking.

Perceived social support. The measures of perceived social support focused both on the perceived disapproval by others and on the perceived behavior of others. We measured perceived disapproval by asking the students to what extent each of four significant referents (mother, father, best friend, other good friends) would disapprove if the respondent were to engage in each of the target behaviors. These items used five-point scales ranging from "would disapprove extremely" to "would not disapprove." We measured perceived smoking and drinking behavior by significant others by asking the students to mark on five-point scales how many cigarettes they thought each of these four referents smoked each day (does not smoke – more than 30) and how many times they drank alcohol each week (none – every day). We ascertained perceived drug use only for best friend and for other friends. The scale was the same as that used for drinking. For the most part, the reliabilities of these scales were very good, with a median value of .83. The reliability coefficient for perceived parental smoking was low ($\alpha = .44$), however, a sign that smoking was not necessarily consistent between parents. Thus, mother's and father's smoking were treated as separate predictors. The reliabilities for the remaining social support belief scales ranged from .67 for parental drinking to .90 for both parental and friends' disapproval of drinking and drug use.

Importance of relationship with friends and parents. Finally, as a check on the assumption that friends would represent a more immediate reference group than parents, we asked the students to rate on five-point scales how important (very important – not at all important) it was to them personally to get along with their mother, father, best friend, and other good friends. We summed these items into two scales representing importance of getting along with parents ($\alpha = .82$) and importance of getting along with friends ($\alpha = .85$).

RESULTS

Perceived Social Support for Smoking, Drinking, and Drug Use

The hypothesis predicting that the interactions would be greater for drug use than for smoking and drinking rests upon the assumption that the former behavior is perceived as more deviant than the latter behaviors. Although we did not test this assumption directly, some indication of the extent to which it is true can be obtained by comparing the perceived disapproval by others for the three behaviors. To this end we conducted separate repeated-measures multivariate analyses of variance (MANOVA) on perceived disapproval by parents and by friends. For parents, the mean disapproval scores were 1.92, 1.95, and 1.07 for smoking, drinking, and drug use respectively ($F(2,4146) = 790.19$, $p < .001$, $\eta^2 = .28$). Post hoc comparisons using a Newman-Keuls test showed that the students perceived significantly less parental disapproval for drinking and smoking than for drug use ($p < .05$ in both cases). Disapproval of smoking and drinking did not differ significantly ($p < .05$). A similar pattern was evident for perceived disapproval by friends. The mean scores were 4.06 for smoking, 3.99 for drinking, and 2.28 for drug use

($F(2.4104 = 2340.91, p < .001, \eta^2 = .53)$). As with parents, post hoc tests revealed that smoking and drinking were disapproved significantly less than drug use, but did not differ significantly from one another. These analyses thus confirm that these young people perceive smoking and drinking as less deviant than drug use.

Importance of Friends and Parents

We tested the relative importance of getting along with friends and with parents using a repeated-measures MANOVA. Overall, relationships with friends ($x = 4.06$) were rated as more important than relationships with parents ($x = 4.44$). $F(1.2856) = 461.93, p < .001, \eta^2 = .14$. This finding is consistent with the assumption that friends represent a more immediately relevant reference group than parents for these adolescents.

Predicting Current Substance Abuse

We used a series of generalized least squares hierarchical regressions to predict baseline smoking, drinking, and drug use from the attitude and belief measures. Because data were highly skewed, we obtained robust estimates of the standard errors for the regression coefficients (Bentler 1989). On the first step we tested a simple additive model (Model 1) by entering the gender, age, attitude, and perceived social support main effects. On the second step we tested the interactive model (Model 2) by adding the appropriate attitude-social support product terms to the equations. We tested the hypotheses concerning age by adding the second-order (Model 3) and third-order (Model 4) interactions involving age to the equations. Scores on all predictors were centered about their respective means, as is recommended when multiplicative terms are included in a regression analysis (e.g., Fisher 1988; Mardsen 1981). We considered both the statistical and the substantive significance of the increase in explained variance resulting from the addition of the interactions in order to determine the adequacy of the additive versus the interactive models.³ Once a final model was obtained, we examined the regression coefficients and their associated significance tests to determine which, if any, of the specific interactions were significant and to ascertain the nature of these interactions. Where necessary, we reversed the scale scores before conducting these analyses, so higher scores always represented more favorable attitudes and beliefs. Table 1 shows the correlations among the variables in the models.

³ We ascertained the statistical significance of the increase in R^2 by applying the usual F-test: $F = [(R_f^2 - R_r^2)/(k_f - k_r)]/[1 - R_f^2]/(N - k_f - 1)$, where R_f^2 is the variance explained by the full (interactive) model, R_r^2 is the variance explained by the restricted (additive) model, and k_r and k_f are the number of parameters to be estimated in the two models respectively. Because of the relatively large sample, in small increases in R^2 could achieve statistical significance in these tests. Therefore, to be considered substantively meaningful, an R^2 increase of .02 was required, corresponding to a "small" effect size in multiple regression analysis (Cohen 1977, p.413).

Table 1. Correlations among Attitudes, Perceived Social Support, and Behavior at Baseline

Variable									
Smoking (N = 2700)									
Smoking	1.00								
Mother's smoking	.06	1.00							
Father's Smoking	.10	.30	1.00						
Friends' Smoking	.55	.07	.11	1.00					
Parental Disapproval	.35	.06	-.08	.33	1.00				
Friends' Disapproval	.24	.04	.03	.42	.36	1.00			
Attitude	.50	-.03	.01	.43	.31	.38	1.00		
Gender	-.09	.04	.03	-.15	-.18	-.20	-.03	1.00	
Age	.18	-.01	.01	.25	.32	.24	.09	-.13	1.00
Drinking (N = 2684)									
Drinking	1.00								
Parental Drinking	.13	1.00							
Friends' Drinking	.54	.11	1.00						
Parental Disapproval	.36	.16	.37	1.00					
Friends' Disapproval	.33	.10	.50	.42	1.00				
Attitude	.50	.18	.52	.44	.59	1.00			
Gender	-.24	-.05	-.30	-.26	-.29	.31	1.00		
Age	.24	-.02	.38	.39	.39	.35	-.16	1.00	
Drug Use (N = 27131)									
Drug Use	1.00								
Friends' Drug Use	.60	1.00							
Parental Disapproval	.29	.27	1.00						
Friends' Disapproval	.32	.42	.26	1.00					
Attitude	.43	.43	.21	.48	1.00				
Gender	-.10	-.14	-.08	-.26	-.17	1.00			
Age	.03	.08	.04	.12	.12	-.16	1.00		

Note: A correlation of approximately .04 is significant ($p < .05$).

Table 2 summarizes the contemporaneous predictions of baseline smoking, drinking, and drug use. The additive models predicted these behaviors relatively well, accounting for 41.5 percent of the variance in smoking, 37.3 percent of the variance in drinking, and 41.3 percent of the variance in drug use. The addition of the attitude-perceived social support interaction terms to the models, however, led to statistically and substantively significant increases in the predictions of all three behaviors. On the average, the addition of these interactive terms to the equations increased the R^2 by .05. In general, then, these analyses provide evidence for the interactive rather than the additive model in predicting current or ongoing smoking, drinking, and other drug use. Contrary to our predictions, however, contingent consistency effects were not more evident for drug use than for smoking or drinking. In fact, the interactions were greatest for smoking ($R^2 = .078$), followed by drinking ($R^2 = .048$) and finally by drug use ($R^2 = .027$). Also contrary to

expectations and previous research (e.g., Andrews and Kandel 1979), the three-way age interactions involving age were neither statistically nor substantively significant for smoking or drinking. In the case of drug use, Model 4 was a statistically significant improvement over Model 3. Even so, the R^2 increase associated with this model was modest (.013) and substantively meaningless. Thus we found little support for the hypothesis that contingent consistency interactions would be greater among younger than among older adolescents.

Table 2. Summary of Models Predicting Current Smoking, Drinking and Drug Use

Model	R^2	R^2 Increase	F Increase	df F Increase
Smoking				
Model 1	.415*	—	—	—
Model 2	.493*	.078	82.65*	5.2686
Model 3	.503	.010	11.19*	5.2781
Model 4	.504*	.001	1.08	5.2676
Drinking				
Model 1	.373*	—	—	—
Model 2	.419*	.046	52.89*	4.2672
Model 3	.422*	.003	3.46	4.2668
Model 4	.424*	.002	2.31	4.2664
Drug Use				
Model 1	.413*	—	—	—
Model 2	.440*	.027	43.44*	3.2703
Model 3	.448*	.008	3.04*	3.2700
Model 4	.461	.013	21.68*	3.2697

* $p < .001$.

The regression coefficients from Model 2 are displayed in Table 3 for smoking, drinking, and drug use. Solving the equations for representative high and low values reveals that all of the interaction terms constitute contingent consistency effects. In each case, the behavior in question was most likely or most frequent when attitudes and perceived social support were both favorable. The target behaviors were relatively infrequent otherwise.

We hypothesized that the interactions between attitude and perceived social support would be more likely for beliefs focused on friends than on parents and for beliefs focused on behavior as opposed to disapproval. Four of the seven significant interaction terms were focused on friends and four were focused on perceived behavior. In every case, interactions involving beliefs about friends' behavior were significant. We used Lagrange Multiplier tests to contrast the coefficients for the attitude x friends' behavior interactions directly with those for other interactions.⁴ These tests rejected the equivalence of these interaction terms for all behaviors and all comparisons ($p < .001$ in all cases). Thus they indicate that the coefficients associated with the attitude x friends' behavior interactions are significantly larger than those for the other attitude x social support interactions.

⁴ We conducted these tests by regressing a latent variable with a fixed variance of 1 on each of the observed variables to obtain standardized predictors (see Bentler 1989, p. 152). The latent variables then were regressed on the substance use measures. We placed constraints on these regression equations such that the effects associated with the attitude x friends' behavior interaction and with each of the other attitude x social support interactions were forced to be equal. The Lagrange Multiplier tests evaluated the effects of releasing these constraints in a stepwise fashion.

Table 3. Regression Coefficients for Interactive Effects Predicting Current Behavior

Predictor	SE		beta	t
	b	b		
Smoking				
Age	.16	.071	.03	2.25*
Gender	-.08	.102	-.01	-.79
Mother's Smoking	.04	.030	.02	1.34
Father's Smoking	.07	.027	.04	2.64**
Friends' Smoking	.94	.063	.33	14.86***
Parental Disapproval	.33	.057	.10	5.67***
Friends' Disapproval	-.17	.102	-.05	1.63
Attitude	.87	.082	.26	10.51***
Attitude x				
Mother's Smoking	.01	.028	.00	.42
Attitude x				
Father's Smoking	.07	.028	.05	2.56*
Attitude x				
Friends' Smoking	.69	.066	.27	10.43***
Attitude x				
Parental Disapproval	.21	.058	.07	3.58**
Attitude x				
Friends' Disapproval	-.08	.114	-.03	.72
Drinking				
Age	-.03	.033	-.01	-.91
Gender	-.08	.044	-.03	-1.76
Parents' Drinking	.03	.023	.02	1.42
Friends' Drinking	.41	.038	.27	10.70***
Parental Disapproval	.07	.024	.06	3.08***
Friends' Disapproval	.03	.024	.02	1.10
Attitude	.36	.023	.33	15.83***
Attitude x				
Parental Drinking	.02	.020	.02	1.06
Attitude x				
Friends' Drinking	.25	.033	.20	7.67***
Attitude x				
Parental Disapproval	.04	.021	.05	2.11*
Attitude x				
Friends' Disapproval	.04	.017	.05	2.21*
Drug Use				
Age	-.05	.020	-.04	-2.49**
Gender	.01	.029	-.00	-.30
Friends' Drug Use	.34	.085	.30	3.99***
Parental Disapproval	.22	.123	.10	1.78
Friends' Disapproval	.01	.014	.02	.86
Attitude	.14	.021	.17	7.03***
Attitude x				
Friends' Drug Use	.13	.040	.24	3.14**
Attitude x				
Parental Disapproval	-.01	.065	-.01	.20
Attitude x				
Friends' Disapproval	.03	.020	.05	1.23

• $p < .05$; ** $p < .01$; *** $p < .001$.

Another way to approach this question is to examine the variance explained by the different interaction terms. Additional regression analyses showed that models consisting of the additive terms plus only the attitude x friends' behavior interactions predicted the behaviors nearly as well as the model containing all of the interaction terms. The R^2 values for models containing only the main effects and the attitude x friends' behavior interactions were .486, .416, and .439 for smoking, drinking, and drug use respectively. In each case the decrease from Model 2 (Table 2) is quite small, averaging only .004. Commonality analyses showed that between 63 percent and 70 percent of the increase in explained variance resulting from the inclusion of the attitude-social support interactions could be attributed to the unique effects of the attitude x peer behavior term. In contrast, the combined effects of all of the other attitude interaction terms accounted uniquely for only 4 percent to 7 percent of this increase. The remaining variance was shared among the interactions. This it appears that perceptions of friends' behavior, a measure of social support neglected in most attitude theories, is the primary contributor to the significant contingent consistency effects found here.

Table 4. Correlations among Attitudes, Perceived Social Support, and Behavior at Final Measurement Point

Variable											
		Smoking (N = 1348)									
Baseline Smoking	1.00										
Final Smoking	.69	1.00									
Mother's Smoking	.03	.01	1.00								
Father's Smoking	.09	.09	.31	1.00							
Friends' Smoking	.56	.45	.04	.08	1.00						
Parental Disapproval	.34	.27	.01	.07	.34	1.00					
Friends' Disapproval	.24	.22	.02	.02	.44	.37	1.00				
Attitude	.48	.41	-.07	.01	-.46	.33	.38	1.00			
Gender	-.12	-.11	.03	.04	-.21	-.22	-.24	-.07	1.00		
Age	.19	.12	-.05	-.02	.28	.29	.27	.10	-.33	1.00	
		Drinking (N = 1309)									
Baseline Drinking	1.00										
Final Drinking	.60	1.00									
Parental Drinking	.11	.11	1.00								
Friend's Drinking	.54	.46	.06	1.00							
Parental Disapproval	.33	.26	.17	.30	1.00						
Friends' Disapproval	.36	.32	.09	.52	.42	1.00					
Attitude	.51	.44	-.16	.52	-.40	.58	1.00				
Gender	-.26	-.29	-.06	-.38	-.29	-.39	-.38	1.00			
Age	.28	.24	-.07	.42	.30	.39	.39	-.33	1.00		
		Drug Use (N = 1304)									
Baseline Drug Use	1.00										
Final Drug Use	.28	1.00									
Friends' Drug Use	.55	.25	1.00								
Parental Disapproval	.27	.09	.29	1.00							
Friends' Disapproval	.32	.21	.40	.26	1.00						
Attitude	.42	.22	.37	.18	.44	1.00					
Gender	-.09	-.04	-.14	-.06	-.28	-.20	1.00				
Age	.10	.05	.05	.05	-.13	.15	-.33	1.00			

Note: A correlation or approximately .05 is significant ($p < .05$).

Changes in Smoking, Drinking, and Drug Use

Use of each substance at the final data collection point was predicted from use one year earlier and from the age, gender, attitude, and perceived social support main effects (Model 1). Then we entered the attitude-perceived social support interaction terms (Model 2), followed by the two-way age interaction terms (Model 3) and finally the three-way age interactions (Model 4). Table 4 shows the correlations among the variables used in these models.

Table 5, which summarizes the results from the regressions, shows that none of the behaviors showed substantively significant attitude-perceived social support interactions. On the average, the addition of these interaction terms increased the prediction of changes in substance use by less than .01. Thus the data provide no support for the hypotheses that contingent consistency interactions would be greater in predicting initiation to or change in substance use. Similarly, the addition of the second- and third-order interactions involving age did not substantively increase the prediction of changes in smoking, drinking, or drug use.

Table 5. Summary of Models Predicting Changes in Smoking, Drinking, and Drug Use

Model	R^2	R^2 Increase	F Increase	df F Increase
Smoking				
Model 1	.489*	—	—	—
Model 2	.490*	.001	.73	5.1332
Model 3	.496*	.006	3.16	5.1327
Model 4	.499*	.003	1.58	5.1322
Drinking				
Model 1	.399*	—	—	—
Model 2	.399*	.000	.00	4.1295
Model 3	.402*	.003	1.62	4.1291
Model 4	.404*	.002	1.08	4.1287
Drug Use				
Model 1	.103*	—	—	—
Model 2	.115*	.012	5.61*	3.1292
Model 3	.118*	.003	1.46*	3.1289
Model 4	.131*	.013	6.41*	3.1286

* $p < .001$.

DISCUSSION

The present research compared a traditional additive model of attitudes and perceived social support with an interactive model in predicting current adolescent smoking, drinking, and drug use and changes in these behaviors over a one-year period. The addition of attitude-perceived social support interaction terms to the regression equations led to statistically significant and substantively meaningful increases in the prediction of *current* behaviors. Contrary to expectations, these interactions were found regardless of age and for all of the substance use behaviors considered here. An examination of the individual regression coefficients showed that the interactions uniformly constituted contingent consistency effects. That is, smoking, drinking, and drug use among these adolescents were most frequent when both attitudes and perceived social support were favourable, but were relatively infrequent otherwise.

In contrast, we did not find contingent consistency interactions when predicting *changes* in smoking, drinking, and drug use. Thus no support was provided for the hypotheses that contingent consistency effects would be greater in predicting initiation to or changes in risky behaviors than in predicting current behaviors (Andrews and Kandel 1979). In fact, we found exactly the opposite pattern. This latter finding is congruent with other recent research showing

such interactions for ongoing licit behaviors among adults (Rabow et al. 1987) and young adults (Grube et al. 1986).

We also had hypothesized that contingent consistency interactions would be more likely for beliefs about the behaviors of others than about the disapproval of others and for beliefs about friends than about parents. Support for both of these hypotheses was found in the predictions of current behavior. The significant R^2 increases associated with the interactive model were almost entirely a result of the joint effects of attitude and perceived behavior of friends. Perceived disapproval and perceived behavior of parents were involved less frequently in significant interactions in these analyses and consistently had smaller effects. Although these findings should not be surprising to researchers in the field of adolescent substance use, most of the relevant research on contingent consistency effects and most traditional theories of attitudes and beliefs (e.g., Ajzen and Fishbein 1980; Bagozzi 1982; Triandis 1980) focus on perceived approval or disapproval of others. This shortcoming may explain why the findings concerning contingent consistency effects have been inconsistent and inconclusive.

We offer at least three possible explanations for the findings. First, the general pattern is consistent with an availability-proneness model of substance use (Smart 1980). That is, accessibility may be an important factor in determining the *continuance* of substance use or other similar behaviors (cf. Grube et al. 1986; Rabow et al. 1987). Having friends who smoke, drink, or use drugs may increase availability of these substances or exposure to situations in which they are used. This increased accessibility then would increase the opportunities for those adolescents with a favourable attitude to act on that predisposition. When accessibility is limited, it may not be possible for adolescents to smoke, drink, or use drugs regardless of their attitudes.

Second, the fact that we found these interactions only in predicting established behavior patterns may suggest that they are not related causally to substance use. Instead they may reflect selective friendship choices or concurrently changing patterns of behavior among friends (Kandel 1985). That is, adolescents may tend to seek out friends with similar attitudes and behaviors *after* they initiate smoking, drinking, or drug use, or the behaviors of a group of friends may tend to evolve together in a similar fashion. In either case, ongoing substance use behaviors would become associated with both a positive attitude and a supportive peer group.

Third, it is possible that these interactions reflect rationalization processes. That is, adolescent substance users may overestimate the prevalence of smoking, drinking, and drug use among their friends in order to justify their own behaviors after they are already established (e.g., Sherman et al. 1983; Sussman et al. 1988). In this case the perception of behavioural support may be a necessary condition for the continued expression of a behavior, but one which develops after the behavior has been initiated and which may or may not reflect the actual prevalence of the behavior among peers and friends.

Regardless of the interpretation, attitude-perceived social support interactions may play an important role in supporting the continued expression of many behaviors: contemporary theories of attitudes and beliefs should consider the possibility of these interactions. From a theoretical standpoint, they may help us to understand more clearly how belief systems are organized and how attitudes and perceptions of environmental variables influence each other and affect behavior. Although many contemporary attitude theories implicitly recognize the importance of situational or social variables, none are truly interactional. For at least some behaviors these interactions may be important. Identifying the behaviors, the circumstances under which attitude-social support interactions are likely, and the processes by which such interactions operate should be a major priority for attitude research. In addition, from a practical standpoint, a consideration of such interactions allows for the more precise prediction of current behavior. In the case of adolescent substance use behaviors, these interactions may be particularly important because they provide a more accurate identification of young people involved in smoking, drinking, and drug use.

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