

Chapter 2

Predicting the Initiation of Alcohol Use

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The course of psychosocial development is often marked by the appearance, for the first time, of certain new behaviors, behaviors not previously part of the individual's repertoire. During adolescence, especially, engaging in certain behaviors for the first time serves to define or lay claim to important changes in status that cumulate in the transition between childhood and adulthood. Among behaviors having this function are those that are institutionally recognized as permitted or prescribed components of a more mature status while being discouraged or proscribed for the incumbents of a less mature status. Examples, such as "looking for a job" or "having sexual intercourse," would include also, for many adolescents in American society, "beginning to drink."

Although conceptualizing the appearance of such behaviors as part of an adolescent transition suggests some of the probable goals involved, it does not offer a sufficient explanation of why some adolescents engage in the behavior and others do not. More important, it does not explain why the behavior appears early in adolescence for some and occurs much later for others. Additional explanatory concepts are obviously required to account for the variation in occurrence and time of occurrence of behaviors, such as drinking, that may mark a status transition during adolescence.

As long as an adolescent occupies a status (or an age) in which certain behaviors are discouraged or proscribed, it is useful to consider his engaging in them as departures from regulatory norms. An understanding of behavior that departs from norms may be derived from a social psychology of deviant behavior (see, for example, Jessor, Graves, Hanson, & Jessor, 1968). Such variables as personal values and expectations that can serve as instigators to transgression, individual attitudes and orientations that can serve as personal controls against transgression, and social

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supports and controls that characterize the context in which such behavior occurs—all should have some relation to variation in occurrence and in age of onset of behaviors that are normatively proscribed during adolescence.

Since the proscriptions against many of the behaviors that mark adolescent transitions are actually age- or status-related rather than absolute (the proscriptions tend to be withdrawn or to become inoperative when a certain age is reached, e.g., for drinking, or when a certain status is achieved, e.g., marriage, for sexual intercourse), the most important issue to account for in such cases is not the occurrence-nonoccurrence of the behavior but rather the differential time of its occurrence or age of its onset. It is this fundamental issue of variation in the age of onset of temporarily proscribed behaviors that encourages a coalescence of the social psychologies of deviant behavior and of adolescent development.

As it turns out, several of the aspects cited as characteristics of adolescent development in general in contemporary American society would also be relevant to an account, for individual adolescents, of the factors in transgressions linked to status changes: the importance of independence from adults, the decreasing involvement with the values of the conventional society, the growing tolerance for departures from conventional norms, the attenuated impact of institutionalized social controls, and the increasing centrality of peer support in influencing behavior choice. The relation of social-psychological factors such as these to the process of “becoming a drinker” was the specific focus of the present study of adolescent development.

A relatively unique opportunity to carry out such an investigation was provided by the longitudinal nature of our larger study of the socialization of problem behavior in youth. The larger study is designed to follow adolescents through a four-year period of time, with comprehensive personality, social, and behavioral measures being collected on each subject on an annual basis. By the end of the second year of the study, it was possible to identify two key groups of adolescents: those who were abstainers at year I and remained so at year II of the study, and those who had been abstainers at year I but who had begun to drink by year II. A comparison of the personality and social characteristics of these two groups at year I, when they were *both* comprised of abstainers, would enable us to see whether the expected social-psychological differences already obtained—differences that were to be predictive of the fact that one group would undergo a status transition within the subsequent year, that is, would change from abstinence to drinking, while the other group would continue to remain abstinent.

Two general hypotheses guided the study. Hypothesis one was that there are significant *initial* (year I) differences in social and personality attributes between abstainers who will remain abstainers a year later and abstainers who will have begun to drink by a year later. The social and personality attributes on which initial differences were expected to obtain follow from those mentioned earlier; in general, those who will engage in the transition-marking behavior of drinking should place greater importance on independence, less importance on such conventional goals as academic achievement, have more tolerant attitudes toward transgression, and perceive more social support for drinking than those who will remain abstainers. The full set of hypothesized initial differences between the two groups will be specified below, once the various measures have been presented. Hypothesis two was that, beyond such initial differences between the two groups, those abstainers who have

become drinkers by a year later will have undergone greater drinker-prone *change* on the set of social and personality measures than those abstainers who have remained abstainers. These two hypotheses, one about initial differences and one about differential amount of change, are independent approaches to the prediction of variation in the onset of drinking behavior among adolescents.

Method

Subjects

The subjects of the study are part of a larger cohort of junior-senior high school students who are being followed over a four-year period of time. A random sample of students, stratified by sex and grade level, was originally selected from the enrollment at three junior and three senior high schools in a single school district in a small city in one of the Rocky Mountain states. The entire sample was individually contacted by letter and asked to participate in a study of the personality and social development of youth. Parents of the subjects were also contacted directly by letter and asked for signed permission for their child's participation in the research. Of the designated sample of 2,220 students, 949 (42%) participated in the first year of data collection in April, 1969, and became the basic, starting cohort for the longitudinal study. A year later, in April, 1970, a total of 692 of these students participated again in the second year of data collection.¹ This number is 81% of all those who had not graduated in the interim and were still available (the cohort retention rate was 87% at the junior high level and 69% at the senior high level).

Procedure

Data were collected by means of an elaborate questionnaire (48 pages in length in year I and 54 pages in year II) that consisted of a large number of carefully developed psychometric measures or indexes of a variety of personality, social,

¹Although persistent follow-up efforts were made to gain the cooperation of the 2220 subjects initially designated, the fact that parental permission was a necessity and the fact that participation required remaining after school for an hour and a half or so on a Spring afternoon both contributed to the lower than desirable initial percentage of participation. Retention between years I and II was, however, at a very acceptable level; the overall retention rate of 81% is satisfactory and probably reflects the commitment of the starting cohort to the study, as well as the fact that participants in year II were paid the sum of \$2.00 as compensation for the time involved. Students who moved away from the community were contacted and sent the questionnaire to be filled out and returned by mail. The fact that only 42% of the originally designated random sample of students ultimately participated in the research means that findings on the starting cohort cannot be generalized back with confidence as descriptive of the school population. While this limitation is unfortunate, it does not in any way preclude the testing of hypotheses nor does it diminish the significance of developmental analyses of the starting cohort itself.

behavioral, and demographic attributes. Many of the measures had been devised and validated for previous research (Jessor, Carman, & Grossman, 1968; Jessor, Graves, Hanson, & Jessor, 1968; Jessor, Young, Young, & Tesi, 1970). The questionnaire was pretested with samples from three local schools not included in the final study, and revisions were made on the basis of the pretest findings.

Group administration of the questionnaire took place immediately after school hours at each of the schools. Since many of the questions dealt with personal or intimate material, confidentiality was guaranteed each subject. Questionnaires were dealt with by code number only; the name sheets associated with the code number were removed from the booklets upon completion and stored in a safe deposit box in a bank vault where they could be consulted when necessary. Students' written reactions to the questionnaire were solicited upon completion, and their comments indicate that they found it an interesting and personally worthwhile experience on the whole.

Establishment of Drinker-Status Groups

One section of the questionnaire consists of a detailed inquiry about various aspects of drinking behavior, including frequency of drinking occasions, average intake per occasion, reasons for drinking, and negative consequences of drinking. This section was introduced, in year II, by two questions used to determine drinker status:

1. Have you ever had a drink of beer, wine, or liquor—not just a sip or a taste? (A sip or a taste is just a small amount or a part of someone else's drink, or a swallow or two; a drink would be more than that.)
2. Have you had a drink of beer, wine, or liquor *more than two or three times in your life?*

All subjects who answered "Yes" to *both* questions were classified as drinkers; all others were classified as abstainers.² It was possible to classify 666 of the 692 subjects who took the questionnaire both years as to their drinker status at *both* year I and year II (because of a change in wording from year I to year II, 26 subjects could not be classified with confidence and were dropped from further analyses). The drinker status breakdown that emerged is as follows:

	Group	<i>N</i>	Year I Status	Year II Status
A.	Ab. I–Ab. II	221	Abstainer	Abstainer
B.	Ab. I–Dr. II	77	Abstainer	Drinker
C.	Dr. I–Dr. II	368	Drinker	Drinker

²The concept of "abstainer" as used here applies to those who have never used alcohol, rather than to those who may have used it previously and no longer do. The present definition is consistent with our interest in "beginning to drink" as a status-transition behavior. Abstainers, in this study, may be considered as *those who have not yet begun to drink*; the aim of the research is to predict which of them will begin drinking in the subsequent year.

The breakdown indicates that of the 298 abstainers in year I, 221 remained abstainers in year II, while 77 had become drinkers by year II. It is the comparison of these two groups, group A, which did not undergo a change of status during the year, and group B, which did, that is the central concern of this paper. The 368 students who were drinkers in both years, group C, will serve as a reference point in the comparison of groups A and B and in the interpretation of the differences between them.³

Since it was important to rule out the possibility that age itself would account for the differential change from abstainer to drinker, groups A and B were analyzed for age differences. While mean age in months is slightly higher for group B members, the majority of grade level differences are one month or less, and the age ranges of group A and group B subjects at each grade level fully overlap each other. There is no basis, therefore, for recourse to age differences to account for drinker status change.

Another factor of interpretive concern was differential parental compliance with drinking. With respect to parental *attitude* about adolescent drinking, there is no significant difference between the groups—94% of group A and 88% of group B report their parents as disapproving of teenage drinking. With respect to actual parental *behavior*, 70% of the group A parents are reported to drink, while the figure is 84% for the parents of group B. Although this difference is small, it reaches significance in a chi-square test. Consequently, differential parental modeling of drinking had to be examined as a possible factor influencing change in drinker status among the adolescents. Analyses of variance of the year I data (see Table 2.1) yielded no interaction between parental modeling and drinker status in relation to any of the psychological or social predictors. It was possible, therefore, to rule out parental compliance, both in terms of attitude and of modeling behavior, as influencing the change in drinker status.

Measures

The specific measures employed in the present study are derived from the larger questionnaire, which is designed to assess a variety of variables having to do with instigation to nonconformity, deviance, or problem behavior, with personal and social controls against such behavior and with sources of learning and reinforcement or support for such behavior. A brief description of each of the measures in the year I form of the questionnaire is presented in Jessor (1969).

³The sex and school-level composition of each drinker-status group is as follows: group A (male junior high, $N = 84$; female junior high, $N = 100$; male senior high, $N = 12$; female senior high, $N = 25$); group B (male junior high, $N = 19$; female junior high, $N = 41$; male senior high, $N = 4$; female senior high, $N = 13$); group C (male junior high, $N = 120$; female junior high, $N = 126$; male senior high, $N = 40$; female senior high, $N = 82$). The data to be presented are by the drinker-status groups, A, B, and C, as a whole. Analyses were also carried out by sex and school levels; they indicate highly consistent findings for all sex-by school-level subgroups, which provided justification for combining them as indicated.

Table 2.1 Mean Scores on Personality, Social, and Behavioral Measures Obtained in Year I for Three Drinker-Status Groups

Group Mean Scores on Year I Measures				
Measure	Group A	Group B	Group C	Significance Group A vs Group B
	Ab. I–Ab. II	Ab. I–Dr. II	Dr. I–Dr. II	
	(<i>N</i> = 221)	(<i>N</i> = 77)	(<i>N</i> = 368)	
Personality				
PV-ACR	74.9	68.6	67.3	**
PV-Ind	68.5	70.0	72.9	NS
E-ACR	59.9	54.0	53.4	*
I-E	42.5	42.1	41.0	NS
ATD	188.6	180.9	162.0	*
Religios.	14.8	14.5	12.6	NS
Perceived Social Environment				
Fam. Contr.	6.8	6.6	6.7	NS
Soc. Supp. Dr.	17.7	19.9	24.1	**
Neg. Funct. Dr.	41.3	38.5	32.5	**
Behavioral				
GPA	3.1	2.9	2.8	**
Chu. Attend.	53.0	51.4	34.3	NS
DVB	32.9	35.2	40.5	**

Key: *Mean difference significant at $p < 0.05$, two-tailed t -test; **Mean difference significant at $p < 0.01$, two-tailed t -test; NS: Not significant at $p = 0.05$

In relation to the present focus on the abstainer-to-drinker change during adolescence, the measures listed below follow from and enable a test of the formulation sketched earlier in this paper. More specifically, those most likely to shift to drinking should be those with greater personal instigation to nonconventional behavior (e.g., greater value on independence, lower value on and expectation for such conventional goals as academic achievement), with lesser personal controls against transgression (e.g., greater tolerance of deviance, lower involvement with religion), with lesser social controls against deviance from either parents or institutions such as the church, and, finally, with greater social support for drinking behavior itself. All of the measures have been examined for adequacy of internal psychometric properties and, with one or two exceptions, are characterized by satisfactory homogeneity ratios and Cronbach alphas.

Personality Measures

1. *PV-ACR*: a 10-item rating scale measure of the personal value placed on academic recognition or achievement. A high score suggests commitment to the conventional goal of school success.

2. *PV-Ind*: a 10-item rating scale measure of the personal value placed on independence. A high score indicates an emphasis on autonomous decision and self-determination of life style.
3. *E-ACR*: a 10-item rating scale measure of the degree to which the subject expects to attain academic recognition. A high score indicates high expectation of achievement goals.
4. *I-E*: a 15-item Likert-type scale measuring the generalized belief in internal versus external control. A high score indicates a high internal control orientation.
5. *ATD*: a 30-item scale measuring degree of attitudinal tolerance of transgression. A high score indicates intolerance of deviance. *ATD* is considered to be a personal control measure.
6. *Religios.*: a five-item Likert-type scale of religiosity, the degree of involvement with religion, and the personal importance of religious practices. *Religios.* is also interpreted as a personal control measure.

Perceived Social Environment Measures

7. *Fam. Contr.*: a two-item measure of the subject's perception of family control, i.e., the regulation and sanctions likely to be forthcoming from his parents were he to transgress. *Fam. Contr.* is considered to be a social control measure.
8. *Soc. Supp. Dr.*: a nine-item scale of social support for drinking—a measure of opportunity to learn and be reinforced for drinking, especially by peers.
9. *Neg. Func. Dr.*: a ten-item Likert scale of perceived negative aspects or functions of drinking. This measure is considered to reflect a cognitive control against drinking through its anticipated negative outcomes.

Behavior Measures

10. *GPA*: grade-point average, a measure of actual success in school performance. Considered an indirect indicator of conformity to conventional behavior standards.
11. *Chu. Attend.*: frequency of church attendance in the past year, a behavioral measure of involvement in the adult social control system and of exposure to conventional norms.
12. *DVB*: a 30-item measure of frequency of self-reported deviant behavior, an indicator of actual nonconformity (other than drinking) to conventional norms having to do with stealing, fighting, etc.

These 12 measures operationalize the variables to be considered in accounting for the onset of drinking behavior, and all 12 will be examined in relation to both of the hypotheses at issue. Other measures of nonconforming behavior, such as use of

marijuana, social activism, and petting experience were also collected in year II; they will be introduced later, where they can help to illuminate the meaning of the abstainer-to-drinker status change.

Summary of Method and Hypotheses

Three groups of junior-senior high school students were established on the basis of their drinker status measured at two points in time, one year apart. Group A consists of 221 students who were abstainers in year I and remained abstainers in year II (Ab. I–Ab. II); group B consists of 77 students who were abstainers in year I but who changed to drinkers by year II (Ab. I–Dr. II); and group C consists of 368 students who were drinkers in both year I and year II (Dr. I–Dr. II). Questionnaire data collected on all subjects on the two occasions will be used to compare the groups. The main hypotheses guiding the comparison can now be stated more specifically. Hypothesis one is that those abstainers who change their status to drinkers during the subsequent year will show the following *initial* (i.e., year I) differences from those abstainers who remain abstainers: They will have lower value on academic recognition, higher value on independence, lower expectations for academic recognition, lower internal control, greater tolerance of deviance, lower religiosity, lower family control, greater social support for drinking, fewer negative functions of drinking, lower grade-point average, lower church attendance, and higher self-reported deviant behavior. Hypothesis two is that those abstainers who change their status to drinkers during the subsequent year will, compared with those who remain abstainers, show greater *change* on these same measures in the direction represented by the hypothesized initial differences.

Results

Testing Hypothesis One

The first concern of the data presentation is to enable an appraisal of whether change in drinker status a year later can be predicted from personality, social, and behavioral variables measured the year before. The question at issue is whether there are at year I already evident differences between abstainers who will become drinkers by year II (Ab. I–Dr. II) and abstainers who will remain abstainers by year II (Ab. I–Ab. II). Such initial differences could be interpreted as forecasting or representing the preconditions for an impending change, or as incipient indicators of a change process already underway and likely to become more manifest with the passage of time. The relevant data, mean scores on the various measures at year I, are presented in Table 2.1. Means are presented for all three drinker-status groups so that

comparison of the two initially-abstaining groups, groups A and B, can be made against the group that was already drinking at year I, group C.

The findings at year I are of interest for several reasons. Most salient is the fact that on every measure but one (Fam. Contr.), group B mean scores *lie between* those of group A and group C. In other words, the group that we know will change from abstainer to drinker by the following year is consistently closer to the group that already drinks than is the group that will remain abstinent. Even at the outset, then, a year in advance of the measurement of change in drinker status, differences are already evident between the two abstainer groups, A and B. Such differences, viewed in relation to the characteristics of group C, are taken as indicative of group B's *proneness to shift* from abstainer to drinker status.

More than half of the differences between group A and B reach statistical significance and are in the direction expected from the earlier theoretical discussion. Group A, the group that will continue to abstain during the subsequent year, places significantly higher value on academic recognition and has a significantly higher expectation of attaining such goals than does group B. Group A also has a significantly higher grade-point average, indicating greater actual success in school. With respect to transgression or deviance, group A is significantly ($p \sim 0.05$) more *intolerant* of deviance (ATD) and reports significantly less actual deviance (DVB) than group B. With specific reference to drinking, group A perceives significantly less social support for drinking and perceives significantly more negative functions of drinking than group B. All of these year I findings are consistent with the difference in prospective likelihood of drinking by year II. Group A is clearly more tied in with the conventional achievement orientation of the school system, with attitudes toward transgression in general that serve to inhibit its occurrence, and with less positive and more negative expected reinforcement for the specific behavior of drinking. Group A also values independence less than does group B; while this difference is not of a significant magnitude, its direction is consonant with the larger pattern. This pattern is fully consistent with the continuing abstinence of group A as compared with the subsequent shift to drinking that will take place in group B.

Groups A and B do not differ significantly on certain measures of controls shown in Table 2.1; there is no significant difference between them on religiosity, church attendance, or perceived family controls. These measures on which no difference is apparent in year I will be of particular interest to examine in the year II data, when effects of what may be an ongoing process may have become more apparent.

While the single-variable differences noted above provide support for hypothesis one, a multivariable appraisal enables an examination of the joint predictive power of the year I variables in accounting for the shift from abstainer to drinker. Stepwise, multiple regression analyses were run against the dichotomous criterion of abstainer-to-drinker change versus no change using the year I data for all 298 year I abstainers. Three non-drinking-related personality predictors (PV-ACR, PV-Ind, and ATD) and two drinking-related predictors (Soc. Supp. Dr. and Neg. Funct.) were used. Intercorrelations among these five predictors ranged from 0.04 to 0.35, indicating adequate independence among them; the highest single-variable correlation with the criterion is that for Soc. Supp. Dr., $r = 0.25$. The overall multiple R reached 0.30

($F = 9.74$, which is significant at $p < 0.001$), with the Social Support for Drinking measure, as expected, entering the equation first and accounting for the largest portion of the variance. When only the three nondrinking-related personality predictors are used, the multiple R reaches 0.23 ($F = 8.09$, $p < 0.001$), with PV-ACR first to enter. While the overall multiple R of 0.30 is highly significant and provides unequivocal support for hypothesis one—that there are initial attribute differences that can predict the abstainer-to-drinker change in status measured a year later—the size of the correlation is not large, and only about 10% of the variance in the criterion is accounted for.

Another approach to multivariable analysis was undertaken that makes clearer the degree to which accurate *individual* classification can be accomplished on the basis of an individual's profile of scores on a set of variables taken together. Using year I scores on four of the preceding five variables (Neg. Funct. was dropped because of a missing-data problem), a stepwise, multiple discriminant analysis was carried out. The discriminant function showed highly significant discriminatory power ($F = 9.71$, $p < 0.001$), and the classification matrix derived from it is the following:

			Classified Status	
			By Discriminant Function	
			A. Ab. I–Ab. II	B. Ab. I–Dr. II
Actual	A.	Ab. I–Ab. II	157(151)	64(70)
Status	B.	Ab. I–Dr. II	29(37)	48(40)

This outcome, like the stepwise multiple regression results, strongly supports hypothesis one. However, it is apparent that the number of misclassified subjects in the derived matrix is sizable. Of the 221 subjects whose actual status is group A, the discriminant function classified 64 of them as belonging in group B; likewise, 29 of the 77 subjects whose actual status is group B were classified in group A. The variable to enter the discriminant function first is, again, Soc. Supp. Dr.; it is followed by PV-ACR, which is the only one of the personality variables to enter significantly. If Soc. Supp. Dr. is not used in the profile of scores, a stepwise discriminant analysis based only on the three personality variables (PV-ACR, PV-Ind, ATD) is still significant ($F = 5.56$, $p < 0.001$), but weaker. The classification of subjects derived from this latter discriminant function is what is shown by the figures in parentheses in the preceding matrix; clearly, the number of misclassifications has increased for both groups A and B.

Considering these two approaches to multivariable prediction from year I data to drinker status change by year II, it can be said, in summary, that they provide strong support for hypothesis one while making evident that much of the variance still remains unaccounted for.

One way of making the implications of the year I findings more compelling is to argue that the differences they indicate at year I will become more pronounced or obvious with ongoing development or with the passage of time. That argument can be evaluated by examining the year II data on the same variables that were already examined at year I. The year II mean scores of our three groups are presented in Table 2.2.

Table 2.2 Mean Scores on Personality, Social and Behavioral Measures Obtained in Year II for Three Drinker-Status Groups

Group Mean Scores on Year II Measures				
Measure	Group A	Group B	Group C	Significance Group A vs Group B
	Ab. I–Ab. II	Ab. I–Dr. II	Dr. I–Dr. II	
	(<i>N</i> = 221)	(<i>N</i> = 77)	(<i>N</i> = 368)	
Personality				
PV-ACR	72.8	64.5	62.1	**
PV-Ind	70.1	75.2	76.3	**
E-ACR	58.6	51.8	53.0	**
I-E	56.5	54.6	54.7	NS
ATD	180.9	166.4	158.0	**
Religios.	13.7	12.3	11.8	*
Perceived Social Environment				
Fam. Contr.	7.4	7.1	7.0	NS
Soc. Supp. Dr.	16.8	21.4	22.1	**
Neg. Funct. Dr.	29.2	26.3	26.0	**
Behavioral				
GPA	3.0	2.7	2.7	**
Chu. Attend.	52.2	30.5	24.9	**
DVB	33.5	38.3	40.7	**

Key: *Mean difference significant at $p < 0.05$, two-tailed t -test; **Mean difference significant at $p < 0.01$, two-tailed t -test; NS: Not significant at $p = 0.05$

The findings in Table 2.2 are striking. At year II, nearly all of the measures show larger mean score differences between groups A and B than obtained at year I, and on nearly all the measures the differences between means are highly significant. Several of the measures that were not statistically able to differentiate the two groups at year I (e.g., PV-Ind, Religios, Chu. Attend.) now yield significant differences. In year I, for example, the behavior measure of frequency of church attendance in the past year was almost identical for group A and group B (means of 53.0 and 51.4, respectively); by year II, group A's mean remained essentially the same, 52.2, but group B's mean had dropped to 30.5, very close to the mean of group C. As a further example, ATD, the measure of attitudinal tolerance of deviance, yielded a year I mean difference between group A and B of 7.7, which was barely significant; by year II the mean difference is 14.5, significant at $p < 0.001$. In short, the passage of a year's time eventuates in a clearer separation of the two initially abstaining groups on the variables theoretically expected to distinguish them, and the *direction* of change is exactly as expected, with group B becoming less like group A and more like group C across most of the variables.

A stepwise, multiple regression analysis of the year II data against the abstainer-to-drinker change versus no change criterion yields, as would be expected, a much

higher multiple R than it did for the year I data. The same five predictor variables mentioned above were used; their intercorrelations in year II ranged from 0.05 to 0.46, with Soc. Supp. Dr. still having the highest correlation with the criterion, $r = 0.46$. The overall multiple R is now 0.51 ($F = 34.14$, $p < 0.001$). Again, Social Support for Drinking is, as expected, the first variable to enter the equation; while it still accounts for most of the variance, both PV-ACR and PV-Ind, two personality measures, add significantly to the multiple R . When only the three non-drinking-related personality measures are used, the multiple R reaches 0.33 ($F = 11.89$, $p < 0.001$), and again PV-ACR enters first.

That drinker status established on the basis of year II data about drinking should be better accounted for by variables also measured at year II than by variables measured a year earlier is, of course, not surprising. The point of the data in Table 2.2 goes beyond that demonstration. What it is intended to suggest is that the year I differences shown in Table 2.1 are not arbitrary or ephemeral but instead are indicative of more pronounced differences that are in process of development and that can be seen most clearly in the year II data in Table 2.2. The smaller year I differences can, in light of the year II data, be taken as compellingly associated with the abstainer-to-drinker change in status among our adolescent subjects.

Testing Hypothesis Two

With the preceding data we have shown that there are certain personality, social, and behavioral variables that are associated with the change in status from abstainer to drinker. Those data indicated that *differences in initial level* on certain theoretical variables were predictive of the subsequent drinker status change. The present hypothesis differs from the preceding one in the following way: instead of examining variation in initial level as the determinant of change in drinker status, it invokes another parameter, namely *variation in the amount of change* that occurs on a “predictor” variable between year I and year II. The interest here is in the change itself.

An examination of Tables 2.1 and 2.2 indicates that, on ten out of the 12 measures, group B changed more in raw scores than group A between year I and year II. But raw change scores do not control for differences in initial level. An independent test of the hypothesis about magnitude of directional change requires that differences in initial level on the predictor variables be controlled or partialled out. An appropriate score for this purpose is the Δ gain score, which is the discrepancy between a subject's *actual* year II score and the score that would be predicted for him from the regression of year II scores on year I scores. The use of the overall regression line for the 298 subjects comprising groups A and B in computing subjects' gain scores does control for initial level differences; the procedure generates a change score that has a zero correlation with year I scores and which is interpretable as that part of the year II score that is independent of the year I score.

The analysis of Δ gain scores was pursued by computing the mean Δ gain on each of our 12 measures for groups A and B. The data are presented in Table 2.3; the

Table 2.3 Mean Δ Gain Scores between Year I and Year II on Personality, Social and Behavioral Measures for Two Drinker Status Groups

Group Mean Δ Gain Scores Year I–Year II			
Measure	Group A	Group B	Significance of Difference
	Ab. I–Ab. II	Ab. I–Dr. II	
	(<i>N</i> = 221)	(<i>N</i> = 77)	
Personality			
PV-ACR	1.07	−3.14	*
PV-Ind	−1.14	3.29	**
E-ACR	0.70	−2.01	NS
I-E	0.40	−1.14	NS
ATD	2.19	−6.21	*
Religios.	0.29	−0.87	*
Perceived Social Environment			
Fam. Contr.	0.03	−0.17	NS
Soc. Supp. Dr.	−0.78	2.18	**
Neg. Funct. Dr.	0.59	−1.43	*
Behavioral			
GPA	0.05	−0.08	NS
Chu. Attend.	7.11	−12.07	**
DVB	−0.80	2.27	**

Key: *Mean difference significant at $p < 0.05$, two-tailed t -test; **Mean difference significant at $p < 0.01$, two-tailed t -test; NS: Not significant at $p = 0.05$

plus or minus signs indicate the direction of gain for a given group relative to the direction of overall gain for the combined groups A and B.

The hypothesis that *magnitude of change* on variables theoretically linked with drinker status is associated with actual change from abstainer to drinker status is clearly supported by the data in Table 2.3. In every case, the direction of change of group B relative to group A is as expected, and, in eight of the 12 comparisons, the differences in mean Δ gains are statistically significant (a ninth comparison, I-E, reaches the $0.10 > p > 0.05$ level). Thus, it can be seen that the Δ gain on PV-ACR between year I and year II is –3.14 for group B and 1.07 for group A. Relative to the overall change for the combined groups, group B *decreased* in the value it placed on achievement while group A *increased* over the time interval; the Δ gain score difference is significant at $p < 0.05$. With respect to PV-Ind, the direction of change by the two groups is, as expected, reversed; over the year's interval, group B *increases* in value on independence while group A *decreases* relative to the overall change. Again, this difference in Δ gain scores is highly significant, $p < 0.01$.⁴ An examination of the

⁴It is of interest to note that, in terms of *raw* mean gains over the year, *both* groups decreased in value on achievement, and *both* groups increased in value on independence; the raw gains are not, therefore, as revealing of change *differences* between the two groups as are the Δ gains.

scores for the other variables in Table 2.3 makes clear that the differential changes are in all cases as predicted, and in some cases, e.g., Chu. Attend., of impressive magnitude.

Multivariable analyses of the Δ gain scores on the four variables previously employed were carried out by means of stepwise, multiple discriminant analysis. For all four variables taken together (PV-ACR, PV-Ind, ATD, and Soc. Supp. Dr.), the discriminatory power was highly significant ($F = 16.93, p < 0.001$). This outcome provides further support for hypothesis two. The Soc. Supp. Dr. variable entered first, followed by PV-Ind and then PV-ACR, all adding significantly to the variance accounted for; ATD did not add anything significant. The classification matrix derived was the following:

			Classified Status	
			By Discriminant Function	
			A. Ab. I–Ab. II	B. Ab. I–Dr. II
Actual	A.	Ab. I–Ab. II	159(138)	62(83)
Status	B.	Ab. I–Dr. II	29(28)	48(49)

Although the multivariable analysis provides strong support for hypothesis two, it is clear from the matrix that a sizable number of subjects are being misclassified, 29 of group B and 62 of group A. The figures in parentheses in the matrix represent the classification derived when only the three personality measures are used and Soc. Supp. Dr. is eliminated. While the discriminatory power of this latter cluster is still highly significant ($F = 7.97, p < 0.001$), the marked loss of accuracy in the derived classification matrix over that yielded when Soc. Supp. Dr. is included is noteworthy. Interestingly, the loss is almost entirely for group A, where the misclassifications rise from 62 to 83.

Discussion and Conclusions

Perhaps the most important outcome of the present study is that it has identified a pattern of attributes that seems, for adolescents, to signal a forthcoming shift from abstainer to drinker status. The pattern includes instigation aspects (lower value on academic recognition and a tendency toward a higher value on independence), personal control differences (greater tolerance of transgression), social environment differences (greater perceived support for drinking from others, especially peers, and few negative functions of drinking), and actual behavioral differences (poorer school performance and more frequent engagement in transgressions). These aspects of the overall pattern significantly differentiate abstainers who will have changed to drinkers by the following year, from abstainers who will remain abstainers over the same time period. Further, those who will change to drinker status have characteristics more like those who already drink than do those who will not change. The pattern becomes more sharply etched with the passage of time, the observed

differences becoming larger and new differences emerging on other attributes (e.g., religiosity and church attendance) that are clearly related to the original set. What gives the original pattern added weight is that the data were collected prior to the occurrence of the abstainer-to-drinker change; this is the unique contribution of the longitudinal research design. Given the theoretical implications of the data for the onset of drinking, and given their temporal precedence to that onset, one can make a stronger (though still inferential) *causal* claim than would be possible were the temporal dimension not in the research design.

Next in importance, the study has demonstrated that *change* on these attributes is itself an important correlate of the onset of drinking. Since the measurement of change involves the year II data, it is not possible to claim temporal precedence for the Δ gain scores in relation to the drinker-status change. This situation is further complicated by the fact that, while the change in drinker status was *measured* a year after the initial data were collected, the *actual* change could have occurred at any time during the year's interval. Thus, it is conceivable that the gain score on a personality attribute, e.g., the lowering of PV-ACR, is an *outcome* of beginning to drink rather than vice versa. This is the reason for using the term "correlate" with regard to the change scores; the only data in this study that literally precede the drinker status change in time and which can accurately be termed antecedents are the year I data.

In addition to the general support the data provide for both hypothesis one and hypothesis two, they also enable an ordering of importance of the different classes of attributes involved. The perceived environmental variable, Social Support for Drinking, emerges consistently as most important in relation to becoming a drinker. Not only does it have the highest bivariate correlation with the change criterion ($r = 0.25$ in year I and 0.46 in year II), but it also enters first in all the multivariate analyses and accounts for more of the variance than any of the other variables used. Second in importance, and generally adding significantly, were the instigator variables—value for academic recognition and value for independence—in that order. The person-control variables—tolerance of deviance and negative functions of drinking—while each being significantly related to the criterion in both years, added nothing to the multivariate analyses after the preceding variables had entered. It should be emphasized that, while social support was the single most powerful predictor, when it was excluded from the multivariate analyses the personality variables—PV-ACR and PV-Ind—generated significant multiple R s or discriminant functions. Thus, the account of becoming a drinker cannot rest exclusively on environmental variables alone. This outcome is entirely consonant with our earlier research on deviance employing similar social-psychological concepts (Jessor, Graves, Hanson, & Jessor, 1968).

While the analyses of the results have been organized in relation to the two major hypotheses, there was a third interest that we were able to follow in a preliminary way with these data. The interest was in the extent to which the year I data could predict not simply the change from abstainer to drinker status but also *which of those who began to drink would have problems associated with their drinking*. Information was available on 76 of the 77 subjects who began drinking between year I and year II as to the frequency of drunkenness and the number of negative

consequences due to drinking (trouble with family, friends, school, police, etc.) they had experienced during the year. Of the 76 subjects, 48 had no negative consequences and no times drunk; 20 had *either* at least one time drunk *or* at least one negative consequence; and eight had *at least* one time drunk *and* one negative consequence. Admittedly this approach relies on a rather mild definition of problem drinking, but for teenagers who have just begun drinking the ordering of these three groups is meaningful.

It is of interest to note that seven of the eight subjects with at least two drinking “problems” come from religious groups traditionally opposed to alcohol use—Mormon, Methodist, Baptist, Lutheran, and United Pentecostal. In relation to the theoretical attributes employed earlier to predict the transition from abstainer to drinker, two of them significantly separate the eight subjects who have at least two problems from the 48 with no problems (and show the 20 subjects with one problem to fall in between). The eight two-problem drinkers have significantly higher value on independence (PV-Ind) and significantly lower expectations of academic recognition (E-ACR). In addition, they are significantly higher on another measure relevant to the concern with problem drinking, a 13-item, Likert-type measure of alienation. Thus, there is some preliminary suggestion that coming from a background that proscribes drinking, having strong independence values, and experiencing some personality maladjustment all may conduce, *once one begins to drink*, to problems associated with the drinking. Although the data tend to support these interpretations, their tenuousness due to the small *Ns* and the extremely mild definition of problem drinking must be reemphasized.

According to our earlier discussion, the factors investigated as predictive of or associated with the transition from abstainer to drinker should not be specific to drinking alone but should be general enough to apply to a variety of transition-marking behaviors. To our knowledge, this particular issue has not been examined empirically before by those concerned with the adolescent abstainer-to-drinker shift (e.g., Campbell, 1964; Maddox, 1970). Since our year II data included questions on marijuana use, activist behavior, and experience with petting, it was possible to compare group A (Ab. I–Ab. II) with group B (Ab. I–Dr. II) on these various other behaviors. In all three of these other behavior domains, group B reported a significantly greater amount of the behavior than group A. In terms of percentages, 29% of group B had some experience with marijuana, whereas only 4% of group A reported any (for group C the figure is 33%); 53% of group B reported experience with petting, as against only 19% for group A (for group C the figure is 70%); and 82% of group B reported some social activism participation as against 59% for group A (for group C the figure is 80%). It seems clear from these findings that there is some degree of generality across behavior domains where status transitions during adolescence are concerned. While our focus in this paper has been on the particular shift from abstainer to drinker, the data suggest that various behaviors that can signify a change in status may occur at the same time or, possibly, occur as a syndrome. It is also likely that, if these various behaviors have in common the function of marking a change in status, then the personality and social factors associated with the onset of any one of them are likely to be associated with the onset of all of them.

Despite the significant support gained by both of our hypotheses, the amount of variance actually accounted for by the multiple *Rs* and the accuracy of the discriminant analysis classifications left much to be desired. It is, of course, possible that the time interval predicted—a year—is too short; that is, it is possible that those abstainers who have the theoretical attributes indicative of change to drinker status but who have not become drinkers, have simply not *yet* begun to drink. What this suggests is that the predictive model should be applied again to the same subjects a year later (i.e., year III). This not only would provide further general validation for the model but would enable an examination of the subjects previously misclassified to see whether their behavior finally conforms to the prediction. Such an effort is entirely feasible, given the longitudinal nature of the research.

It is possible, too, that a better mapping of peer-network variables might have explained more of the variance in drinker status. A tentative exploration of this possibility was carried out using a group of subjects incorrectly predicted to become drinkers and a group that was correctly predicted from the same four variables (PV-ACR, PV-Ind, ATD, Soc. Supp. Dr.). Those who were correctly predicted report significantly more friends who are models for transgressions, significantly more approval from friends for engaging in such behaviors, and significantly less parental influence on their attitudes than those who were incorrectly predicted. It may be, then, that variables having to do with exposure to and involvement in the peer culture, beyond simply social support for drinking, would contribute to a measurable improvement in the overall prediction of the abstainer-to-drinker change. Such involvement and exposure could also help to explain the greater amount of change experienced by group B between year I and year II on the theoretical attributes.

This emphasis upon the importance of social factors in the transitions of adolescence is compatible with the general pattern of our findings—the prime role played by the social support variable in the prediction of the abstainer-to-drinker shift. Our research has also made it clear, however, that personality attributes are significantly operative. The overall conclusion we would urge is that adolescent development, including the onset of such transition-marking behaviors as becoming a drinker, is best treated as a joint function of both personal and social variation.

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