Adolescent Alcohol Initiation: A Review of Psychosocial Risk Factors

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Abstract: Longitudinal research studies focused on alcohol use initiation in adolescence were reviewed to determine which variables function as antecedent predictors or risk factors. Only studies that focused on time-1 abstainers were included. Classes of risk factors examined include sociodemographic, family, peer, personality, and behavioral variables. The most consistent antecedent risk factors for starting to drink in adolescence were parental and peer approval and models for drinking and drug use as well as adolescents' own prior involvement in delinquent behavior. There was little evidence for gender differences in risk factors for alcohol use initiation. Secondary analyses of existing longitudinal data sets are encouraged to examine whether there are ethnic/racial differences in the risk factors for starting to drink and to establish those factors that serve a protective or buffering function, delaying onset of alcohol use in adolescence. © Society for Adolescent Medicine, 2004

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Alcohol use is one of the most common health risk behaviors among adolescents. According to the most recent nationwide data (2001), 51% of 8th graders, 70% of 10th graders, and 80% of 12th graders have had at least some experience with alcohol [1]. There are a number of reasons for our concern with these levels of adolescent involvement with alcohol. First, alcohol use in adolescence is associated with an array of other health risk behaviors, including cigarette smoking, illicit drug use, and sexual behavior [2–4]. Second, alcohol involvement increases the risks for adolescents of negative health and social outcomes such as physical and sexual assault, motor vehicle crashes, school dropout, pregnancy, and sexually transmitted diseases [5–8]. Third, alcohol use in early or middle adolescence is associated with greater likelihood of alcohol problems later in life [9–11]. To reduce these risks, it is critical to develop a better understanding of the risk factors for initiating alcohol use in adolescence. Preliminary steps in this process are to establish what is currently known regarding these risk factors and to identify what we need to learn.

Previous reviews of the literature on risk factors for adolescent drinking have been unsatisfactory for several reasons. First, they routinely fail to distinguish between cross-sectional correlates of drinking and antecedent risk factors for drinking. Second, they fail to distinguish between risk factors for initiation and risk factors for other transitions along the dimension of alcohol involvement in adolescence. Third, they assume that if a variable has been shown to be a risk factor for adolescent illicit drug use, it is probably a risk factor for adolescent alcohol use as well (which may or may not be true). All of these deficiencies have led to confusion regarding what is or is not known with respect to the risk factors influencing the initiation of adolescent drinking. The present review explicitly recognizes these pitfalls and should as a consequence provide a more

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useful basis for theory building and the design of preventive interventions. Focusing on risk factors for the initiation of alcohol use rather than risk factors for any alcohol use should be more useful for the design of interventions to prevent or delay the onset of drinking.

The Definition of Alcohol Initiation

How one defines a drinker is by no means settled in the larger literature on adolescent alcohol involvement. A variety of different operational definitions have been used that emphasize different aspects of the experience as defining characteristics, such as the amount of alcohol consumed on a single occasion (e.g., drinking more than a sip or a taste, or having a full drink of one’s own) or drinking alcohol some minimum number of times (e.g., more than two or three times). In the research literature on alcohol initiation, however, the definition of a drinker that has been used most frequently is anyone who has had any alcohol in his or her lifetime. Prenatal exposure to alcohol is not included. For consistency, all of the studies included in this review focus on the transition from lifetime abstention (never use) into any use of alcohol.

Studies defining initiation on the basis of questions about alcohol use in the past month [12,13] or past week [14] were excluded because of the likelihood that some of those considered abstainers were actually drinkers who simply had not had an opportunity to drink within these foreshortened time frames. Other studies that used significantly higher thresholds such as initiation of experimental drinking [15], regular drinking [16–18], “significant” drinking [19], or drunkenness [20] were also excluded because the sub-threshold group consists of drinkers as well as abstainers. Lastly, studies by Kandel [21,22] and Paternoster [23] were excluded because they dealt with the initiation of use of distilled spirits, which typically occurs after the initiation of beer or wine use.

The Definition of a Risk Factor

To be clear, a risk factor is a variable that significantly predicts whether an individual will develop a disorder or disease. According to Mrazek and Haggerty, to qualify as a risk factor, “a variable must be associated with an increased probability of disorder and must antedate the onset of disorder” ([24], p. 127). Similarly, Kraemer et al state that “a risk factor is a measurable characterization of each subject in a specified population that precedes the outcome of interest and which can be used to divide the population into two groups (the high-risk and the low-risk groups that comprise the total population)” ([25], p. 338). Based on these definitions, in order for a variable to be considered a risk factor for the initiation of alcohol use, there needs to be evidence of a statistically significant relationship between the candidate explanatory variable and the onset of adolescent alcohol use (establishing association), and there needs to be evidence that the explanatory variable was present before the adolescent’s involvement in alcohol use (establishing temporal priority).

Cross-sectional data, which have constituted much of the content of previous reviews, can establish that a variable correlates with alcohol use but cannot determine the direction of influence between the two variables. To establish that a variable functions as a possible risk factor for alcohol use requires the collection of longitudinal data. The present review therefore excludes variables for which longitudinal evidence of risk factor status is lacking. The strategy used here is similar to that advocated by Gorsuch and Butler [26]. According to these authors, studies of initial drug use need to display the following design features: they should be prospective longitudinal studies in which candidate risk factors are measured before the respondents used the drug and in which later data are used to identify which individuals went on to try the drug in question.

Inclusion Criteria

Articles included in this review were identified through searches of electronic databases (PsycINFO, 1974–February 2003; Medline, 1966–February 2003) as well as by combing the reference lists of published articles in the literature. Based on the preceding discussion, inclusion criteria to qualify as a study of the initiation of adolescent alcohol use were the following: (a) the sample examined had to consist of middle or high school aged students (studies of college students were excluded because of the vastly different social context of these late adolescents/young adults); (b) the study must have two or more waves of prospective longitudinal data; (c) lifetime (ever) alcohol use must have been assessed at all waves of data collection; (d) analyses had to be restricted to lifetime abstainers at time-1, that is, adolescents who had never had a drink of alcohol; and (e) the analyses had to predict time-2 drinker
status (abstainer versus drinker). Drinkers at time-1 should thus have been excluded from the analyses. Statistically significant time-1 predictors of time-2 drinker status could then be considered potential risk factors for the initiation of drinking.

Based on these criteria, studies that merely predict time-2 alcohol use intensity from time-1 explanatory variables without deleting time-1 alcohol users were excluded from this review because they included both time-1 abstainers and drinkers [27–31]. Also excluded were the numerous longitudinal studies that predicted time-2 alcohol use while statistically controlling for time-1 alcohol use. These latter studies are relevant to change in alcohol use or escalation and do not discriminate between initiation and other progressions along the dimension of alcohol use involvement (e.g., from experimental to regular drinker, or from regular to heavy drinker). They uncritically assume that any risk factor is relevant for change at any point along the dimension. The approach taken here is to establish the risk factors for initiation and to determine their utility for other alcohol transitions later.

A second type of studies meeting the above inclusion criteria consists of studies using event history analyses or survival analyses to predict the length of time from baseline assessment to the initiation of alcohol use [32]. As above, these analyses should have been restricted to those adolescents who had not yet started drinking at baseline, and the variables being evaluated as potential risk factors should have been assessed at baseline or before the onset of drinking.

Classes of Risk Factors to be Examined

Succeeding sections of this review report on the risk factors identified in the qualifying research articles and are organized to reflect the following domains of explanatory variables: sociodemographic, family, peer, personality, and behavioral risk factors. These variables reflect or are relevant to a variety of different theoretical approaches to the prediction of alcohol use in adolescence including Jessor and Jessor’s Problem Behavior Theory [33], Kandel’s Socialization Theory [21], Huba and Bentler’s DOMAIN Theory [34], Catalano and Hawkin’s Social Development Model [35], Brook and Brook’s Family Interactional Theory [36], Aker’s Social Learning Theory [37], Patterson’s Social Context Model [38], Oetting and Donnermeyer’s Primary Socialization Theory [39], and Kaplan’s Self-Derogation Theory [40].

Common theoretical expectations deriving from these frameworks are that the likelihood of adolescent alcohol initiation is greater if parents drink or use illicit drugs, if adolescents do not have a close relationship with their parents, if parents do not monitor their children’s behavior, if adolescents affiliate with deviant or drinking peers, if they are not attached and involved with prosocial peers, if adolescents have tolerant attitudes toward deviance or approve of alcohol and drug use, if they are depressed, anxious, or stressed, if they already engage in other problem behaviors like delinquent behavior or smoking, and if they have little involvement in the conventional institutions of school and religion.

Although the theories cited above are the more important theoretical frameworks examined in the field of adolescent drug and alcohol use, few of them have been put directly to the test of accounting for the transition from abstinence into alcohol use.

Sociodemographic Risk Factors

Most studies of alcohol use initiation have neither examined sociodemographic variables as risk factors nor statistically controlled for them when examining other potential risk factors. There are thus only a few studies relevant to gender, age, racial/ethnic background, and socioeconomic status as potential risk factors for starting to drink. For example, only four studies have examined gender as a potential risk factor [41–44]. Contrary to general expectation, gender is not predictive of the initiation of drinking: only one of the four studies found that 12–14-year-old males were significantly more likely than females to start drinking over the 2-year interval studied [41].

Only two studies examined age as a predictor of alcohol initiation. In a study of 9-, 11-, and 13-year-olds followed up 3 years later, age related significantly to starting to drink [43]. In another study that followed up abstaining 12–14-year-old students 2 years later, however, age was not a significant predictor [41]. This difference in results is likely attributable to the fact that at follow-up, all of the adolescents in the second study were in the period of highest risk for starting to drink (ages 14–16).

With reference to ethnic/racial background, Asian American and African-American adolescents tend to be less likely to drink than white (European American) or Hispanic American adolescents [1]. The longitudinal literature, however, is equivocal about the utility of ethnic/racial background as a predictor of alcohol use initiation. In one study of 12–14-year-old
adolescents in 10 southeastern U.S. cities [41], white adolescents were more likely to start drinking over a 2-year period than were nonwhite adolescents. A study of fifth graders in Seattle followed up through age 17–18 years also showed that white adolescents started drinking at a younger age than nonwhite adolescents [42]. Later survival analyses of this same data set in which the nonwhite category was more finely differentiated found that Asian American youth had a more delayed onset of alcohol use than white youth, but African-American, Native American, and Other youth did not [45]. An additional study of 9-, 11-, and 13-year-olds found that minority adolescents were as likely as white adolescents to initiate alcohol use by follow-up [43], a result probably owing to the composition of the minority category in this sample (two-thirds Native American who are generally more likely to drink than are white adolescents, and one-third African-American who are less likely to drink than white adolescents).

Lastly, in the only study to examine socioeconomic background (assessed by perceived parental education) as a risk factor, it was found to bear no relation to likelihood of alcohol use onset when family structure was also included in the model [41].

**Family Domain Risk Factors**

The family variables that have been found to predict starting to drink fall into three general categories: family composition; parental or sibling modeling and approval of drinking; and parenting and parent-child relationship. Family structure has been examined as a risk factor in only a single longitudinal study of 12–14-year-olds, in which it was found that there is a greater risk of alcohol use initiation for adolescents living with a stepparent than for those living in intact families [41].

Adolescents’ perceptions of family approval and modeling of alcohol and drug use have been shown to predict the initiation of drinking. In a study of 9th and 10th grade students followed up 2 years later [46], adolescents were more likely to start drinking if they reported that their father drank, if their mother used prescription drugs, or if a sibling used drugs, but perceived mother’s drinking, father’s and mother’s smoking, and father’s and mother’s marijuana use did not relate to starting to drink. Perceived drinking by a parent also related to drinking onset in a study of seventh grade students followed up within a year [47]. Perceived parental approval of teen drinking predicted ninth grade alcohol use among sixth grade female abstainers [48]. When parental reports of their own attitudes and behavior were assessed, parental attitudes remain important but their alcohol use does not. Among 11–15-year-old adolescents, mother’s heavier smoking, more positive mother’s and father’s attitudes toward alcohol and drug use, and more positive mother’s attitudes toward smoking predicted alcohol use initiation 1 year later [49]. In this study, neither parent’s frequency of drinking nor their frequency of marijuana use related to adolescents’ starting to drink.

The likelihood of starting to drink was also found to relate to adolescent perceptions of greater mother’s and father’s permissiveness and to lower levels of adolescent identification with the mother in a study of ninth and tenth grade students followed up 2 years later [46].

Earlier timing of the initiation of alcohol use (soon after baseline versus in later waves) was found to relate to lower initial levels of parental support and to perceptions of less parental disapproval of teen drinking in a four-wave study of seventh to ninth graders [50]. Similarly, survival analyses have shown that the greater the level of perceived parental alcohol and drug use [42, 51] and the more permissive the parents’ norms regarding teen drinking [45], the younger the age of alcohol use onset. These results parallel those derived from the studies predicting onset versus no-onset above.

**Peer Domain Risk Factors**

Most peer variables examined as potential risk factors for drinking onset reflect peer involvement in delinquent or drug-using behaviors or perceived peer attitudes toward drug use, rather than more qualitative aspects of adolescent-peer relationships. In a 2-year study of high school students, onset of drinking was associated with greater peer deviance, greater friends’ use of legal and illegal drugs, and greater identification with friends [46]. In a study involving two waves of assessment within a single school year, high school seniors who started drinking in the spring reported greater drinking among their friends the previous fall [52]. Social assertiveness in childhood, which can be interpreted as independence from peer influence, predicts delayed onset of alcohol use, at least up through age 14 [53]. Peer alcohol use and peer marijuana use were two of the three significant predictors of the initiation of alcohol use in a study of seventh grade students [47]. High estimates of the prevalence of alcohol use
among other students have also been shown to predict the onset of alcohol use among seventh and eighth grade abstainers [54,55]. Fisher and Bauman [56] found that seventh grade abstainers who had a friend who drank at time-1 were more likely to onset drinking by time-2. Urberg et al [57] found that it was best friend’s alcohol use and not the alcohol use of the larger friendship group that predicted initiation of alcohol use among 6th, 8th, and 10th grade students.

In a study of the predictors of time to onset of drinking among seventh to ninth grade abstainers, significant time-1 predictors included perceptions of the number of friends who drank and their perceived approval for drinking [50]. Similarly, age of first drink was found to be predicted in survival analyses by level of friends’ alcohol involvement [42,45] and by friends’ use of tobacco and alcohol [51].

In a study that clustered seventh and eighth grade adolescents on the basis of their similarity on both family and peer variables, abstinent teens described as “problem behavior prone” (who saw their parents as unconcerned about their alcohol use, who saw alcohol as available, and whose friends were unconcerned about their alcohol use or who used alcohol) were more likely to start alcohol use a year later than were other teens [58].

**Personality Domain Risk Factors**

In the present review, a broad definition of personality was employed. Thus, the domain of personality factors includes personal attributes such as values, beliefs, and expectancies in addition to temperament factors and affective disorder factors (depression, anxiety, internalizing disorders). The onset of drinking among abstainers is signaled in this literature by antecedent personality attributes reflecting lower levels of conventionality, greater negative affectivity, greater behavioral under-control, and higher alcohol expectancies.

The personality risk factors reflecting psychosocial unconventionality that have been linked to the initiation of drinking are the following. In relation to the conventional institution of school, lower values on academic achievement [46,50,59], lower expectations of academic achievement [50,59], and lower school motivation [60] increase the likelihood of starting to drink in samples of 9–10th graders, 7–9th graders, 7–11th graders, and 9th graders, respectively. Lower levels of bonding to school also related to a younger age of alcohol use initiation [42]. More general indicators of psychosocial unconventionality were also associated with starting to drink. These include more tolerant attitudes toward deviant behavior [46,50,59], lower levels of religiosity [44,50], less of an orientation to hard work [46], greater rebelliousness [46], and greater rejection of parental authority [44].

Although alcohol is often used by drinkers as a means of coping with stress, anxiety, or depression, there have been few studies of adolescents that have focused on negative affectivity as a motivation to start drinking. In a study of 9-, 11-, and 13-year-olds followed up for 3 years, the number of depressive symptoms at baseline predicted who would start to drink [43]. Similarly, alcohol use initiation 2 years later was significantly predicted by depressed mood among 9–10th grade adolescents [46]. With respect to anxiety, alcohol use initiation over a 3-year interval was found to relate positively to the number of generalized anxiety symptoms and negatively to the number of separation anxiety symptoms at baseline (at ages 9, 11, 13 years), but not to relate to overall anxiety symptoms at baseline [43].

The evidence linking negative affectivity to initiation of drinking is not univocal, however. One study found that abstaining high school seniors who exhibited greater negative affectivity and internalizing symptoms in the fall semester were less (not more) likely to initiate drinking by spring semester [52], a contrary finding possibly attributable to their lower level of involvement with peers. A second study reports no significant relation between a diagnosis of major depression at age 11 years and the onset of drinking 3 years later [61]. The nonsignificant odds ratios for both genders in this study are likely affected, however, by the low prevalence of major depression at baseline (3.4% for boys, 2.9% for girls).

As a result of our stringent inclusion criteria, there are few longitudinal studies that have examined temperament variables such as emotionality or sociability as potential risk factors for alcohol use initiation in adolescence. In the single qualifying study, Fleming et al [62] found that teacher ratings of shyness or lack of social contact in first grade were associated with delayed onset of beer/wine use in adolescence among African-American girls and, to a lesser extent, boys.

Whereas the construct of behavioral under-control [63] is important in studies of the onset of alcohol use disorders [64–67], its components (risk-taking, im-
pulsivity, sensation-seeking) have not been examined to any degree as antecedent risk factors for alcohol use onset in adolescence. Only one qualifying study has demonstrated the longitudinal predictive utility of sensation-seeking for alcohol use initiation among seventh grade students [44], and only a single study has shown that greater impulsivity in 11-year-olds serves as an antecedent risk factor for starting to drink by age 14 years [61].

Lastly, a number of alcohol-related personality domain variables have been shown to function as risk factors for the initiation of drinking. Adolescents with more reasons not to drink are less likely to start drinking a year later [59], or they started drinking later than those with fewer reasons not to drink [50]. Abstainers in seventh grade who agreed more strongly that drinking enhances social interaction were more likely to initiate drinking a year later than those who did not agree with these expectancies regarding the effects of alcohol use [68]. Starting to drink was also more common over a 1-year period among seventh grade students who rated the effects or consequences of alcohol use as being more likely and more positive [69].

**Behavioral Domain Risk Factors**

One of the most consistent behavioral risk factors for starting to drink in adolescence is prior involvement in delinquent behavior [44,46,50,52,59]. Abstinent adolescents reporting more frequent antecedent involvement in delinquent behavior were more likely to initiate drinking. Kellam et al found in an African-American sample that teacher-rated aggressiveness in first grade, particularly aggressiveness in the context of having few friends (characterized as “shyness”), was predictive of male drinking as adolescents [70]. McGue et al found that psychiatric diagnoses of conduct disorder, oppositional defiant disorder, or of any externalizing disorder at 11 years of age significantly increased the likelihood of starting to drink by age 14 years [61].

Also implicated in longitudinal research as behavioral risk factors for starting to drink are lower grades in school [59,61], more frequent cigarette smoking and dieting in sixth grade girls [48], and greater levels of television viewing and exposure to music videos among ninth grade students [71]. Lower grades in school also predict starting to drink sooner rather than later [50].

**Gender Differences in Risk Factors for Initiation**

Less than half of the studies reviewed above examined whether there were differences between male and female adolescents in the risk factors for initiation of drinking. Of the 11 studies that did examine gender differences, seven performed tests for gender by risk factor interactions and found them to be statistically nonsignificant [41,46,49,54,57,58,72]. In an eighth study, the Jessor and Jessor study predicting the timing of onset of drinking, within-gender analyses found that 11 of the 12 variables that were statistically significant in the combined-gender analyses were significant predictors within each gender group as well [50].

Of the remaining three studies comparing results by gender, two report only modest differences. Pedersen and Skrondal found that three predictors (parental alcohol consequences, friends' norms, and friends' tobacco and alcohol use) displayed identical regression coefficients for both genders, but a fourth variable (parental norms) entered for girls but not for boys [51]. Marks et al found that perceived prevalence of drinking predicted onset of drinking somewhat more strongly for girls than for boys: of those adolescents who were above the median in perceived prevalence of alcohol use at time-1, 32% of the girls and 29% of the boys started drinking at time-2 (in contrast to 15% of the girls and 16% of the boys who were below the median) [55]. In the final study that performed within-gender analyses, correlation coefficients were reported only if significant, making it impossible to determine whether the effect sizes were actually different for the genders [53]. Overall, then, the evidence suggests that the risk factors for starting to drink are generally similar for male and female adolescents.

**Age Differences in Risk Factors for Initiation**

Given that the prevalence of alcohol use increases with age throughout adolescence, one might expect that the risk factors for early adolescent initiation of use would differ in nature and intensity from those that predict later adolescent initiation. However, none of the research studies reviewed here explicitly addressed the issue of whether the risk factors for alcohol use initiation differ as a function of the age of the adolescents. That would require parallel follow-up studies of cohorts of early and middle adolescents assessed with the same measures at baseline, or following up adolescents of varying ages and
looking for age by risk factor interactions in predicting initiation by the follow-up assessment.

Most of the prospective studies examined in this review started with cohorts of early adolescents (6–8th graders) and followed them up later in the same school year [47], a year or so later [44,54–56,58,68,69], or several years later [41,43,48]. Only three of the studies started with cohorts of middle adolescents (9–12th graders) who were followed up while still middle adolescents [46,52,71]. Other studies combined early and middle adolescents but did not examine the interaction of age at baseline with the other risk factors [49,50,57,59].

It is not really possible to address this issue by just sorting the reprints into piles based on the age of the samples at baseline. The main obstacle to this is the lack of consistency in the variables assessed in the different studies. Only a few variables were assessed in studies at two different substages of adolescence. Among these, peer alcohol use was consistently important in all studies in which it was included. Delinquent behavior was a significant risk factor in both early adolescent samples [44] and late adolescent samples [52], whereas behavioral undercontrol was significant in early adolescence [44] but not in late adolescence [52]. Beyond this, definitive statements concerning age differences in adolescent risk factors must await more systematic examination.

**Risk Factors and Theories of Adolescent Alcohol Use**

In an earlier section, a number of theoretical expectations that derive from a variety of frameworks were listed regarding the factors that should increase the likelihood of making the transition from abstinence into alcohol use. The preceding sections of this review provide support for the great majority of these expectations. The likelihood of adolescent alcohol initiation is greater if parents drink or use illicit drugs, if adolescents do not have a close relationship with their parents, if adolescents affiliate with deviant or drinking peers, if adolescents have tolerant attitudes toward deviance or approve of alcohol and drug use, if they are depressed or anxious, if they already engage in other problem behaviors like delinquent behavior or smoking, and if they have less involvement in the conventional institution of school. There was no support for the expectation that those who would start drinking would have less involvement in the conventional institution of religion [50,59], a result possibly ascribable to the use of church attendance as a measure of this. Other expectations simply were not addressed in the qualifying articles: these include the expectations that the likelihood of alcohol initiation is increased if parents do not monitor their children’s behavior, if adolescents are not attached and involved with prosocial peers, or if the adolescents are stressed.

Although these findings support the relevance of these factors for the prediction of alcohol use initiation, they cannot be used to determine which of the theories are supported most strongly by this review. First, most of the research articles reviewed were not designed to test specific theories of alcohol use. Second, there is considerable overlap among these theories in their components. What distinguishes one theory from another is often whether variables such as parent-child relationships have a hypothesized direct influence on adolescent alcohol use or whether their influence on initiation is indirect or mediated through other variables such as affiliation with deviant peers (where a distant parent-child relationship increases affiliation with deviant peers, which relates to alcohol use initiation). In the absence of studies explicitly designed to compare and contrast the utility of specific theories for the prediction of the initiation of alcohol use in adolescence, it is impossible for a review such as this to say much about their relative merits.

Antecedent psychiatric disorders, despite their low prevalence in the population, also appear to play a role in the initiation of alcohol use among affected youth. Although this result seems to contradict the hypothesis that mental disorders are more relevant to movement into heavier or problematic drinking than to initiation [73], it is not necessarily dissonant. The relationship may be a consequence of the relatively long interval in these studies between baseline and the assessment of drinking onset. By the time of the 2–3-year follow-up, those adolescents with antecedent psychiatric disorders may well have been involved not only in drinking but also in problematic drinking (which was not measured) as well.

**Gaps in the Literature**

Risk factor research with respect to the initiation of alcohol use needs to be instituted in younger, that is, elementary-school-aged, children. Almost all of the longitudinal studies reviewed above have been carried out in cohorts of adolescents who were in grade seven (age 13 years) or older. Yet we know from epidemiological research that 50% of eighth grade
students in the United States have already started drinking [1]. Most of what we know about alcohol initiation in adolescence therefore describes only ‘normative onset,” that is, the initiation of alcohol use at the ages when most adolescents start to drink. The risk factors for childhood/preadolescent onset of drinking may well differ from those predicting normative adolescent onset.

Aside from the single report by Zimmerman and Schmeelk-Cone on school motivation as a risk factor among African-American adolescents [60], there have been no longitudinal studies establishing the risk factors for alcohol initiation in minority (non-European American) adolescents. First, most studies of minority adolescents have been cross-sectional in design (or have not yet appropriately analyzed their longitudinal data), and thus only establish the psychosocial correlates of adolescent alcohol use [74–81]. Second, where longitudinal data have been collected on minority adolescents, the data have been analyzed predicting variation in time-2 alcohol use without limiting the analyses to time-1 abstainers [29,82,83], or the analyses predicted a dependent variable that reflected multiple substance use onset rather than just alcohol use initiation [84,85]. Studies are needed that test whether those variables that serve as risk factors for the initiation of alcohol use among white adolescents also serve as risk factors for adolescents from African-American, Hispanic American, or other ethnic/racial groups. Research is also called for that examines the predictive utility across cultures of a broad array of potential risk factors. This information could be used to adapt preventive interventions for use in environments where it is feasible to present interventions tailored for adolescents of specific ethnic/racial, cultural, or national backgrounds.

A further issue that needs to be addressed is whether the variables identified here as risk factors for initiation also function as risk factors for other transitions along the dimension of adolescent alcohol involvement. Although a number of theories focus on the explanation of adolescent involvement in alcohol and drug use, few have paid attention to developing models of risk factors for specific transitions along the dimension of alcohol involvement (e.g., for initiation, or from experimentation into regular drinking). Problem Behavior Theory suggests that the same variables would predict all transitions along this dimension [33]. According to this framework, it is “transition-proneness,” as reflected in more unconventional or problem-behavior prone scores on the personality, perceived social environ-
or processes through which risk factors affect initiation.

Not much is currently known about variables that serve as protective or buffering factors against the adolescent initiation of alcohol use. According to one definition of protective factors, as variables that relate negatively to alcohol use, many of the variables described above could be considered protective factors. The problem with calling variables protective factors just because they correlate negatively with alcohol use is that they can be converted to risk factors simply by reverse scoring them. Rutter [94] proposed a second, more restrictive definition, widely used in the field of developmental psychopathology [24,95–98], that states for a variable to qualify as a protective factor, it must significantly reduce the likelihood that an individual who is at risk for an outcome will experience that outcome. In statistical terms, this type of protective factor “moderates” the relationship between a risk factor and an outcome or “buffers” the impact of risk factors on the individual (as shown by a significant multiplicative interaction term between the candidate protective factor and a risk factor in a regression model). When the protective factor is present, there should be considerably less alcohol use or a lower likelihood of alcohol use than would be expected given the risk factors that are also present.

Only one of the studies reviewed here performed the interaction analyses to determine whether selected variables moderate the impact of the other risk factors examined. Brook et al used two-way analyses of variance to examine personality and family variables as potential protective factors against peer risk factors [46]. In this study, a higher achievement orientation, less maternal rejection and permissiveness, greater identification with parents, and higher family expectations buffered the impact of more deviant or drug-using friends on alcohol use initiation at time-2. The problem in this area is not that potentially protective variables have not been assessed, it is that analyses have generally not been undertaken to establish whether they perform this important buffering function.

Concern with establishing protective factors folds into the larger issue of encouraging the development and testing of more complex models of risk that include mediating as well as moderating variables in multiple-wave longitudinal models. Mediating variables would reveal the pathways by which some risk factors indirectly affect initiation of alcohol use, whereas moderating variables would indicate where relations between risk factors and initiation differ in magnitude, direction, or form as a function of third variables (including sociodemographic factors or potentially protective factors). To date, there have been few such longitudinal models focused on adolescent drinking initiation. With the continuing development and refinement of statistical analysis programs to perform latent transition analysis [99], hierarchical linear modeling [100], structural equation modeling and latent growth curve modeling [101–103], and latent variable mixture modeling [104], the possibilities for capturing the complexity of adolescent development are enhanced. Use of these methods should permit determination of whether a variable is a causal risk factor, a correlate, or a mediator of other risk factors [105,106].

Although several of the concerns expressed here do require the design and collection of new data, most can be ameliorated through re-analyses of existing longitudinal data sets. Secondary analyses could profitably be pursued in the larger of these longitudinal data sets to develop a better understanding of the natural history of adolescent drinking, to determine the risk factors for transition into alcohol use, and to evaluate the cross-ethnic or cross-national utility of various frameworks of variables for the prediction of transition into alcohol use. This may require greater federal support for the archiving of longitudinal data sets collected in earlier years.

A major limitation of the present review of the literature is that many of the variables examined as risk factors were assessed in only a single study. Further research is needed to determine whether these risk factors demonstrate the same antecedent predictive function when measured in other ways in other samples in other geographic areas at other times. There are, nevertheless, a number of variables that have been shown to be risk factors for starting to drink in several different longitudinal studies. Variables with the best support for their status as risk factors include the following: perceived parental drinking, parental approval for adolescent drinking, perceived friends’ alcohol and drug use, and self-reported delinquent behavior.

With regard to the role of aspects of the larger social environment as risk factors for alcohol initiation, efforts need to be made to incorporate the influence of community norms, the neighborhood, the school context, the influence of the mass media, as well as the structures of economic opportunity, alcohol access and availability, and of legal sanctions and enforcement into research on alcohol use initiation. Despite their obvious importance, these poten-
tial domains of risk have not figured thus far in longitudinal investigations of the transition from abstention into alcohol involvement among adolescents.

It is to be hoped that future research in the field will begin to develop the knowledge that is currently missing regarding the etiology of alcohol involvement among adolescents. Only through the development of a greater understanding of these issues will there be improvements in the effectiveness of preventive interventions for use with adolescents.

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