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# Early onset and recent drug use among children of parents with alcohol problems: data from a national epidemiologic survey

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## Abstract

There is good evidence that children of parents with alcohol problems have more drug involvement, plus related mental health and behavioral problems. In this study, we sought to estimate the degree to which these children might be more likely to initiate drug use precociously. A sample of 2888 parent–child pairs was identified within public data files of the National Household Survey on Drug Abuse (NHSDA), 1995–1997. Alcohol dependence of one parent was assessed by that parent's report of three or more dependence manifestations. Independently, one randomly selected 12–17 year-old child of the parent answered self-report survey questions on age at first use of tobacco, alcohol, and marijuana. In analyses contrasting 114 children of alcohol dependent parents (AD+) with 2774 other children (AD–), youths with alcohol dependent parents had higher odds than other kids to have used tobacco in the past year (odds ratio, OR = 3.2, 95% confidence interval, CI = 2.05–4.98), as well as alcohol (OR = 1.6, 95% CI = 1.05–2.50), and marijuana (OR = 2.9, 95% CI = 1.71–4.90). Survival analyses were used to clarify excess risk of early-onset drug use. For example, by age 17, an estimated 73% of AD+ children had smoked tobacco cigarettes, 70% had started drinking, and 41% had smoked marijuana, versus 44%, 57%, and 26% of AD– children, respectively. This new evidence helps build a case that children of parents with alcohol problems experience precocious drug use. © 2001 Elsevier Science Ireland Ltd. All rights reserved.

*Keywords:* Alcohol dependence; Children of alcoholics; Epidemiology; Adolescents; Etiology

## 1. Introduction

In this study we have tested for associations between parental alcohol problems and a possibly precocious initiation of alcohol, tobacco cigarette and marijuana use within a nationwide sample of children of alcohol dependent (AD+) and non-dependent (AD–) parents in the US. According to US population estimates, a large number of children live in homes with at least one parent who is dependent on alcohol or other drugs. Estimates from the 1996 National Household Survey on Drug Abuse (NHSDA) show that an estimated 6%, or ~4.5 million children under 18 years, live with a parent in need of treatment for a drug problem (Huang et al., 1998). Nearly 4% or an estimated 2.8 million live

with parents who are dependent on illicit drugs, and an estimated 8.3% or ~6.2 million live with at least one parent who is dependent on alcohol. Overall, one out of ten children under the age of 17 years lives with a parent who is currently dependent on alcohol and/or illicit drugs. Grant (2000) has suggested that as many as 1 in 4 children under the age of 18 years in the US live with one or more adults who have abused or have been dependent on alcohol at some time in their lives.

Several studies have shown that children of parents with alcohol problems are at an elevated risk of non-medical drug involvement (Rittenhouse and Miller, 1984; Gfroerer, 1987; Reich et al., 1993; Lynskey et al., 1994). Using data from the National Longitudinal Survey of Youth (NLSY), Jennison and Johnson (1998) studied the association between familial alcohol dependence and the development of drug problems in adult children. The study showed that a positive family history of alcohol dependence was associated with alcohol

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dependence in adult children. In another study, [Gabel et al. \(1998\)](#) compared the family backgrounds of adolescent boys in a residential treatment center for alcohol and drug problems with youth from a community control group. Adolescent children with severe alcohol or drug problems were more likely to have come from families in which the mother had alcohol problems. Paternal alcohol problems, on the other hand, were not associated with adolescent alcohol problems in the probands. However, given that the children were largely from father-absent families in an exclusively clinical sample, this finding is subject to multiple interpretations.

Regarding sex differences in behavioral outcomes among children of alcohol dependent parents, some studies show male–female differences in the occurrence of drug use or psychiatric disorders depending on which parent has the problem. Boys whose fathers have alcohol problems are more likely than girls to use drugs ([Chassin et al., 1996](#); [Werner, 1986](#)). Also, [Yu and Perrine \(1997\)](#) have shown that the transmission of alcohol problems seems to be gender specific (mothers affect daughters and fathers affect sons). Others do not report any differences between male and female children ([Lynskey et al., 1994](#)). In a recent study by [Obot et al., 1999](#), who used data from the National Household Survey on Drug Abuse (NHSDA), variation in the occurrence of delinquent behavior between children of parents with or without alcohol dependence were not associated with the sex of the child or that of the parent.

Though multiple family factors (e.g. parental psychiatric disturbances and living in a stressful environment) may be linked to adolescent drug use ([Tsuang et al., 1998](#)), several studies have shown that the associations linking drug use to parental alcohol problems are largely independent of other risk factors. For example, using a community sample of 454 adolescents, [Chassin et al. \(1991\)](#) showed that parental alcohol dependence was a strong predictor of adolescent alcohol use, irrespective of other environmental and family process variables. When these children were re-tested as young adults, the suspected effects of parental alcohol dependence remained consistent ([Chassin et al., 1999](#)). In our earlier study focusing on mental health and behavioral problems, the existence of parental alcohol problems was associated with delinquency excesses even after controlling for several socio-demographic factors ([Obot and Anthony, 2000](#)).

While there is evidence that children of alcohol dependent parents are more likely to use alcohol and other drugs than other children, it is of interest to assess whether they also initiate drug use earlier. [Clark et al. \(1998a\)](#) studied early adolescent gateway drug use in a sample of 10–12 year-old boys whose fathers had drug use disorders. Among their findings was the obser-

vation that children of dependent fathers were more likely to initiate tobacco and alcohol use before other children; adolescent-onset drug involvement was associated not only with lifetime use of marijuana and hallucinogens, but also with the transition from first drug use to dependence and psychiatric disorders ([Clark et al. 1998b](#)). In a follow-up study of drug use among adolescents, [Chassin et al. \(1996\)](#) showed that being a male child and having a father with alcohol dependence were predictors of increased use of drugs over time. However, there is evidence from some studies that paternal history of alcohol use disorder may not be independently associated with drinking history or other drinking variables in children ([Tarter et al., 1997](#)).

Despite evidence linking parental alcohol dependence to the risk of drug use by children, there still are few epidemiologic studies with large community samples that provide data with a high degree of generalizability. For the most part, studies of children of alcohol dependent parents are based upon treatment-seeking parents or other clinical samples. Here, using data from a national probability sample of the National Household Survey on Drug Abuse (NHSDA), we investigate whether children of parents with alcohol problems are more likely to initiate use of tobacco, alcohol and marijuana at an earlier age than other children. We assessed differences in recent (i.e. past year) drug use in the two groups of youths, in order to evaluate persistence of drug use in these groups, as well as initiation of use.

## 2. Method

### 2.1. Study population and sample

This study utilized data from the public use files of the National Household Survey on Drug Abuse (NHSDA) conducted between 1995 and 1997 (Substance Abuse and Mental Health Services Administration, 1997, 1998, 1999)<sup>1</sup>. The NHSDA is a primary source of data on licit and illicit drug use in the non-institutionalized US population 12 years or older; it uses cross-sectional, multistage area probability sampling methods. The homeless, residents of jails and hospitals, and active military personnel are excluded from the study, but residents of households, shelters, dormitories, and rooming houses are included. The design allows for the over-sampling of Blacks, Hispanics and young people. Participants are interviewed at their place of residence and the interview lasts for ~ 1 h. Between 1995 and 1997, 60,521 interviews were

<sup>1</sup> This is a summary of previous descriptions of the NHSDA methodology which can be found in [Obot and Anthony \(2000\)](#) and [Obot, Hubbard and Anthony \(1999\)](#).

conducted, with a survey sample that included 16,977 youth aged 12–17 years.

The NHSDA design allows the inclusion of more than one respondent in the household. In the sample from 1995 to 1997, a total of 3359 male and female parent–child pairs, in which both a parent and an adolescent living in the same household, were assessed. The sample used in the present study of adolescents was limited to 12–17 year-olds. The minimum age of parents was 27 years. We imposed this restriction on parental age in order to maintain at least a 15-year difference between parent and child. This was to prevent improbable or very rare age combinations (for example, a 25 year old parent with a 15 year-old son or daughter) which might be caused by occasional miscoding of an adult as a parent (Gfroerer, 1987). Children of parents who did not meet this criterion ( $n = 471$ ) were excluded from the sample. We also considered the chance that a respondent in 1 year of the NHSDA was interviewed again the following year or next. However, because the probability that a particular parent–child pair was selected in two or more NHSDA surveys is

too small to influence results, we chose to ignore the likelihood of such duplicates.

The resulting study sample consisted of children from 2888 parent–child pairs. As shown in Table 1, these pairs included 1487 male youth and 1401 female youth. Among these were 114 children of alcohol dependent parents (AD+) and 2774 children whose interviewed parent was not dependent on alcohol (AD–). There were 2069 female and 819 male parents, roughly consistent with US census data on the relative proportion of children growing up in female-headed households (US Bureau of the Census, 1992).

## 2.2. Procedure

The interview process begins when a field assessor visits the residence for a voluntary screening interview with any resident 18 years or older. This index person provides information on age, sex, race/ethnicity, and marital status of all residents aged 12 years and older. The screening information is used to draw one, two, or more residents for the in-depth interview, via probabil-

Table 1  
Socio-demographic characteristics of children of alcohol dependent (AD+) parents and children of non-dependent (AD–) parents<sup>a</sup>

Characteristics of children	Children of non-alcohol dependent (AD–) parents ( $n = 2774$ )		Children of alcohol dependent (AD+) parents ( $n = 114$ )	
	<i>n</i>	%	<i>n</i>	%
Sex of child				
Male	1437	51.8	50	43.9
Female	1337	48.2	64	56.1
Sex of parent				
Male	760	27.4	59	51.8
Female	2014	72.6	55	48.2
Race/Ethnicity				
Black	834	30.1	42	36.8
White	1832	66.0	70	61.4
Other	108	3.9	2	1.8
Tobacco use				
Never used	1971	71.0	58	50.9
Former user	296	10.7	13	11.4
Used in past year	507	18.3	43	37.7
Alcohol use				
Never used	1853	66.8	64	56.1
Former user	132	4.8	8	7.0
Used in past year	789	28.4	42	36.9
Marijuana use <sup>b</sup>				
Never used	2403	86.7	84	73.7
Former user	124	4.5	7	6.1
Used in past year	244	8.8	23	20.2
Parental marijuana use				
>100 days/past year	264	9.5	28	24.6
Never/less frequent	2510	90.5	86	75.4

<sup>a</sup> Data from the National Household Survey on Drug Abuse, 1995–1997.

<sup>b</sup> *n* for AD– does not equal 2774 because of missing data.

ity sampling. After seeking and receiving the consent of the selected person(s), information is gathered with a combination of self-administered answer sheets and standardized interview schedules. Interview response rates were 80.6% for 1995, 78.6% for 1996, and 78.3% for 1997 (Substance Abuse and Mental Health Services Administration, 1997, 1998, 1999). The survey is conducted in accord with human subjects procedures approved by the cognizant Institutional Review Board (IRB).

### 2.3. Measures

#### 2.3.1. Parental alcohol problems

The alcohol dependence status of parents was assessed using NHSDA items adapted from the Diagnostic Interview Schedule (DIS) for DSM alcohol dependence. Items include tolerance, using alcohol more than intended, reduction in important activities due to alcohol, and health problems due to alcohol. Using the criterion of 3 or more alcohol-related problems in the past 12 months, there were 114 children of parents with active alcohol problems (AD+ youth; mean age 14.3 years) and 2774 'control' children whose assessed parent did not meet this criterion (AD– youth; mean age 14.3 years).

#### 2.3.2. Age of initiation and recent drug use

Two measures of drug use were used in the study's separately conducted interviews of youths. These were age of initiation of drug use and reported use of drugs in the past year. Age of initiation was assessed with the question: 'How old were you the first time you used [the drug] the first time?' The measure of recent (past year) drug use was based on responses to a questionnaire item on recency of tobacco, alcohol and marijuana use (e.g. 'How long has it been since you last smoked a cigarette?'). These age-of-onset data are used to reconstruct the cumulative probability of the occurrence of a drug-taking experience, as demonstrated elsewhere by Warner et al. (1995).

#### 2.3.3. Socio-demographic characteristics

In order to control for their potentially confounding effects, we included selected socio-demographic variables and covariates in the statistical analyses. These variables were sex of the child and parent, race/ethnicity, frequency of parental illicit drug (marijuana) use, and age of the child. We treated age as a continuous variable; sex of child and parent were dummy-coded 0 for female and 1 for male. There were three race/ethnicity categories, namely, White, Black and Other. Frequency of parental illicit drug use was coded 1 for use of marijuana/hashish exceeding 100 days in the past year, and 0 for 'never' or less frequent use.

### 2.4. Statistical analysis

Via STATA software (Stata Corporation, 1999), two types of analysis were conducted to examine differences in: (1) age of initiation of drug use; and (2) past year drug use, in the two groups of adolescents. We used survival analysis methods to estimate the cumulative age-specific probability of first use of tobacco cigarettes, alcohol and marijuana (i.e. Kaplan-Meier estimates of the cumulative probability of first use of each drug). We also estimated instantaneous hazards or risk of initiation during specified time intervals, via calculating the difference between the cumulative probability of first use up to a specified age with respect to cumulative probability corresponding to the prior year. The hazard function portrays risk across time and the magnitude of the hazard for each year of life is the risk of initiating drug use in that year, given no use prior to that year, as discussed by Singer and Willett (1994). We used log-rank procedures as an aid in testing and interpreting comparability of survival functions.

In the second analysis, we used multinomial logistic regression (McCullagh and Nelder, 1989) to estimate the odds of recent (past year) drug use by children whose parent was or was not found to be dependent on alcohol. We included three categories of drug use, namely, never used, former user (used more than 1 year ago), and more recent use (used within the past year). In these analyses, selected socio-demographic variables were included in the model to control for their potentially confounding effects.

In preliminary analyses to compare estimates before and after application of survey analysis weights, we found essentially comparable results. For this reason, we have presented the simpler analyses without application of analysis weights. In consequence, we do not claim that these estimates are 'nationally representative' although the sample originated as a nationwide probability sample.

## 3. Results

### 3.1. Initiation of drug use

#### 3.1.1. Tobacco cigarettes

Substantial differences between AD+ and AD– children in the initial age of tobacco use are shown in Fig. 1. For example, based upon survival analysis, the estimated cumulative probability of tobacco use initiation by age 17 was 73% for AD+ children and 44% for AD– children ( $X^2_{(1)} = 18.76$ ,  $P < 0.001$ ). Differences between the two groups had become prominent by the age of 11 years, when 15% of AD+ children had initiated tobacco use as compared to only 7% of AD–

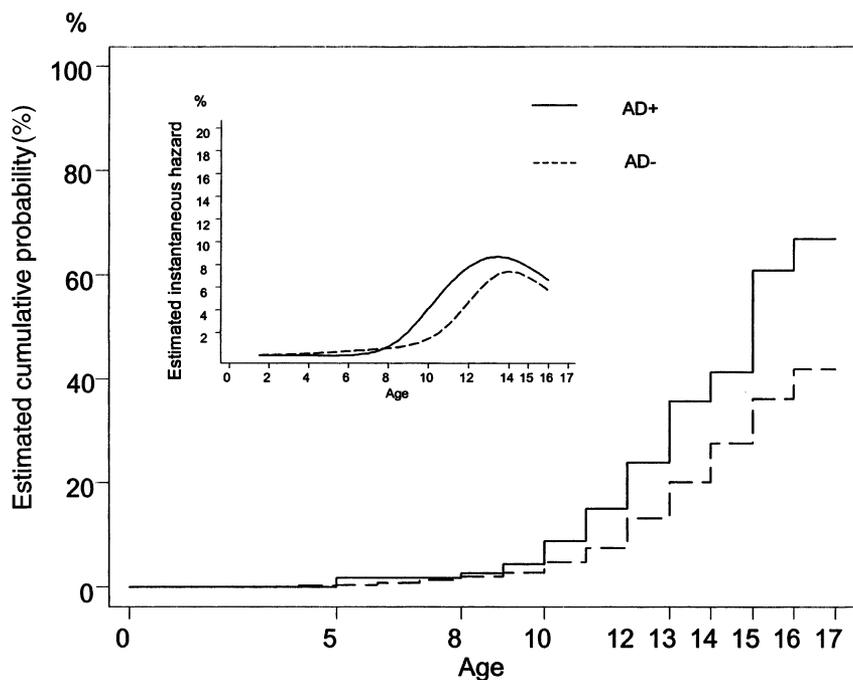


Fig. 1. Risk of tobacco use initiation among children of parents with (AD + ;  $n = 114$ ) and without (AD - ;  $n = 2,774$ ) active alcohol disorders. Data are from the US National Household Survey on Drug Abuse, 1995–1997.

children. For both groups of youths the peak age of initiation of tobacco cigarette use was after 12 years, with some indication of lower risk by age 16.

Fig. 1 (inset) also shows how the estimated age specific risk of initiation of tobacco cigarette use was greater for AD + than AD - children. Age-specific hazard estimates were higher for AD + than AD - children beginning from after the age of 8 years. For example, at 14 years, an estimated 8% of AD + children versus 6% of AD - children started to use drugs, given no use prior to that age. In addition, the peak instantaneous hazards occurred somewhat earlier for AD + group than for the other children (12–15 years versus 13–15 years).

### 3.1.2. Alcohol

Fig. 2 is a depiction of the estimated cumulative probability of initiation of alcohol use for AD + and AD - children. By the time the youths were 17 years old, the estimated cumulative probability for alcohol use initiation was 70% for AD + and 57% for AD - children ( $X^2_{(1)} = 6.07$ ,  $P < 0.05$ ).

The peak instantaneous (age-specific) hazard for the initiation of alcohol use (see Fig. 2 inset) was estimated to have occurred at about the same time for both groups of children (13–16 years). But by 14 years the estimated age-specific rate of initiating alcohol use was greater for AD + children (15% per year) than for the other children (10% per year).

### 3.1.3. Marijuana

Fig. 3 depicts the estimated cumulative probability of initiation of marijuana use for the two groups of children. By the age of 17 years, the estimated cumulative probability is 41% for AD + children and 26% for the other children ( $X^2_{(1)} = 24.76$ ,  $P < 0.001$ ). As for children with a parent having alcohol dependence, there was a

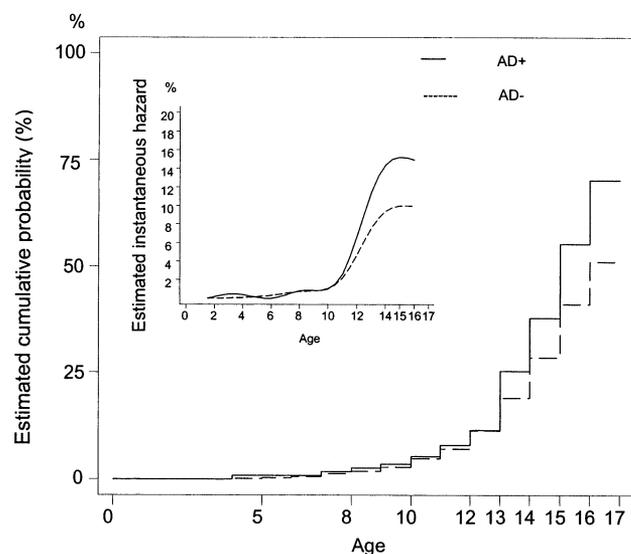


Fig. 2. Risk of alcohol use initiation among children of parents with (AD + ;  $n = 114$ ) and without (AD - ;  $n = 2,774$ ) active alcohol disorders. Data are from the US National Household Survey on Drug Abuse, 1995–1997.

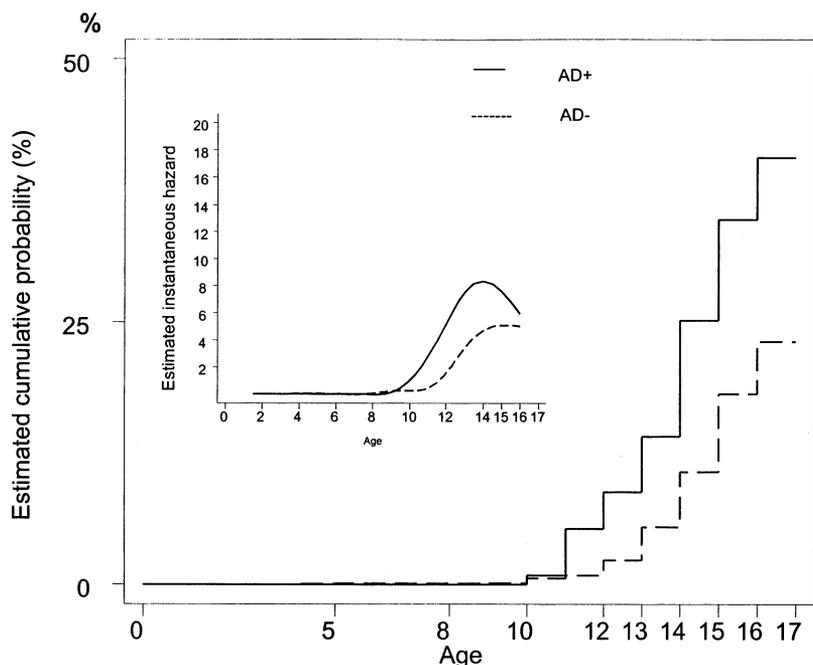


Fig. 3. Risk of marijuana use initiation among children of parents with (AD+;  $n = 114$ ) and without (AD-;  $n = 2774$ ) active alcohol disorders. Data are from the US National Household Survey on Drug Abuse, 1995–1997.

steep rise in the instantaneous hazards starting by age 10, with a peak value observed by age 14. For the other children, risk of initiating marijuana use started to be expressed  $\sim 2$  years later (by age 12), and peak values were observed at age 15. As shown in Fig. 3 (inset), there is a marked difference between the two groups of children between 11 and 14 years, with some leveling off after that age. The greatest difference between the two groups in age specific risk of drug initiation is at age 13 when the rate of initiating marijuana use by AD+ children was almost double the rate experienced by the other children (9% per year versus 5% per year).

### 3.2. Past year drug use

We tested for the association between youth past year drug use and the alcohol dependence status of the parent. AD+ children were more likely than AD- children to have reported past year use of tobacco cigarette (OR = 2.9, 95% CI = 1.91–4.32,  $P < 0.001$ ), alcohol (OR = 1.5, 95% CI = 1.03–2.29,  $P = 0.034$ ), and marijuana (OR = 2.7, 95% CI = 1.67–4.35,  $P < 0.001$ ). The strength of the association between parental alcohol problems and recent drug use by the children did not change appreciably with statistical adjustment for the potential effects of social and demographic characteristics (adjusted tobacco cigarette OR = 3.2, CI = 2.05–5.00; adjusted alcohol OR = 1.6, CI = 1.05–2.50; adjusted marijuana OR = 2.9, CI = 1.71–4.90; data not shown on a table).

## 4. Discussion

The main finding of this study is that children of a parent with active alcohol dependence initiated use of alcohol, tobacco cigarette and marijuana earlier and at higher age-specific rates than children whose parent did not have alcohol dependence. These differences started to emerge as early as the age of 9 years and the excess risk was sustained at least through 17 years of age (the oldest age under study in this sample). In addition, when we looked at recent drug use by these groups of children, AD+ children were more likely to be recent users of tobacco cigarette, alcohol and marijuana. As such, the evidence reported here adds some detail to previous findings that children of alcohol dependent parents are more likely to engage in problem behaviors than other children (Obot and Anthony, 2000; Lynskey et al., 1994).

This study had several strengths and some weaknesses. Among the strengths is that respondents were drawn from a naturally representative sample of the general population, unlike samples in most prior studies, which have recruited primarily clinic-based volunteers. Second is that responses from parents were collected separately from responses of the youths, using a method that was standardized. Finally, we were able to combine several years of the NHSDA to get a sample large enough to allow precise estimation and to permit adjustment for social and demographic characteristics.

A limitation of the study is that we had alcohol dependence information on only one parent because just one randomly selected parent was interviewed in each household. It might be that the parent not interviewed had alcohol problems. If so, our group of AD – children is somewhat ‘contaminated’ by the alcohol dependence status of the un-assessed parent, and the net result is to bias our estimate towards the null. (If it were possible to identify and to exclude these children, our results would have become even stronger.) A second limitation involves temporal sequencing. Because the study is cross-sectional, it is not possible to establish the sequencing of cause-effect relationships concerning parental alcohol problems and drug involvement of the children. At least in some cases, drug use by the children might have preceded parental alcohol problems and other familial problems might have precipitated the observed early onset drug use (Sher, 1991). Nonetheless, one suspects that in most instances parental alcohol dependence precedes youthful drug use of children.

Another limitation is that we based our determination of alcohol problem status on self-reported presence of three or more DSM criteria for alcohol dependence. It is possible that a more careful assessment of alcohol dependence by an experienced clinician might have yielded more accurate results, although the validity of interview methods resembling those used in the NHSDA has been studied and found to be quite good for disorders such as alcohol dependence (Anthony et al., 1985; Helzer et al., 1985). We relied upon self-report of drug use, and hence may have underestimated the occurrence of drug use among the youths. These limitations notwithstanding, this study provides new evidence that children of parents with alcohol problems experience earlier onset drug use. Its epidemiologic sample guards against a bias of serious concern, namely, the predominant use of clinical samples in prior research on this topic.

Though AD + children had higher odds of initiating use of all three drugs at an earlier age than AD – children, there were some distinct differences among drugs in the cumulative and age-specific hazards. For example, there is a clear divergence in age-specific (instantaneous) hazards for alcohol initiation at about the age of 14 years between AD + and AD – children. This may be due to differences in parenting practices or parent–child relationships that are not specific to the consumption of alcohol, as suggested by Chassin et al. (1999), and by Chilcoat et al. (1996). One might look for the origins of the observed differences in a combination of genetic and environmental factors (Elkins et al., 1997). For example, some investigators have found that offspring of alcohol dependent parents rate their drink-

ing experiences more positively than other children (Alford et al., 1991). Whereas this observation may be due to social learning within the home of an alcohol dependent parent, it also may be a manifestation of inherited vulnerability in the response to alcohol consumption.

In summary, we now have new epidemiological survey estimates to confirm what others have gleaned from more selected samples and in research specifically focused upon children of alcohol dependent parents. The present study’s estimates provide a clear view of the earlier onset and greater persistence of not just alcohol consumption but also tobacco and marijuana consumption among these children as compared with children whose assessed parent did not qualify as a case of active alcohol dependence. On this basis, we have all the more reason to press toward more definitive evidence on two issues of central importance: (1) What are the causal mechanisms that account for earlier onset and more persistent drug-taking observed among children of alcohol-dependent parents?; and (2) Is it possible that inferences about the maladaptive consequences of early-onset drug use have been distorted because we have not taken into account the excess of parental alcohol dependence among youths who initiate drug-taking precociously? With respect to the first issue, there already is some forward progress in longitudinal research, with some emerging evidence that children of alcohol-affected parents are not supervised and monitored as thoroughly as other children (Chilcoat et al., 1996), and that early features of temperament may distinguish these children, and might promote earlier occurrence of drug taking (Blackson et al., 1996). A recent synthetic conceptual model provides guidance for new longitudinal research along these lines (Tarter et al., 1999). With respect to the second issue, in our own work on early-onset drug use and later risk of drug problems (Anthony et al., 1985), we did not take into account the potential influence of parental alcohol dependence, nor have many of the other investigators who have contributed evidence on this problem (Tenant and Detels, 1976; Robins and Przybeck, 1985; Chou and Pickering, 1992). It is possible that early-onset drug use qualifies as a non-causal marker of special vulnerability to later drug problems, but does not merit a place in the list of the multiple causes of drug problems.

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