

# Adolescent and Young Adult Antisocial Behavior and Adult Alcohol Use Disorders: A Fourteen-Year Prospective Follow-Up in a National Survey\*

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**ABSTRACT.** *Objective:* Data from the National Longitudinal Survey of Youth (NLSY) are used to examine the association between antisocial behaviors (ASB) reported in youth (15-22 years old) and alcohol use disorders (AUD) 14 years later in a large ( $N = 7,326$ ) representative national sample. *Method:* Structural equation modeling generalized to dichotomous outcomes was used to assess the associations between latent variables of ASB with latent variables of AUD and background variables. *Results:* Exploratory factor analysis of 17 ASB items yielded three factors having clear interpretations with the literature—property offenses, person offenses and illicit substance involve-

ment. When examined in the context of the multivariate structural equation model, several independent associations between ASB and AUD symptoms and covariates were found. Although there were significant and independent effects for each ASB factor on each of the alcohol use disorder factors, the strength of the association was strongest for the effects of early illicit substance involvement on alcohol abuse and dependence. *Conclusions:* Both illicit substance involvement and delinquency other than illicit substance involvement reported in 1980 were associated with alcohol use disorders 14 years later. (*J. Stud. Alcohol* 61: 524-528, 2000)

DEVIANT BEHAVIOR, conduct disorders and adult antisocial personality disorder have long been associated with substance abuse (Cadoret et al., 1985; Fillmore, 1988; Harford and Parker, 1994; Huizinga and Elliot, 1981; Jessor et al., 1991; Jessor and Jessor, 1977; Kellam et al., 1983; Knop, 1985; McCord and McCord, 1960; Robins, 1966; Rydelius, 1983; Vaillant, 1983; Windle, 1990). Early onset and greater variety of early conduct problems, aggressive behavior and the presence of attention-deficit hyperactivity disorder (ADHD) may increase, not only the risk for later antisocial behavior (ASB), but also the risk for later substance abuse (Fleming et al., 1982; Loeber, 1988; Mills and Noyes, 1984; Robins and Przybeck, 1985).

Drawing upon the National Longitudinal Survey of Youth (NLSY), the present study examines the association between reports of antisocial behavior in 1980, when the NLSY respondents were aged 15-22 years, and subsequent alcohol use disorders in 1994. Previous analyses with the NLSY reported significant associations between the frequency of antisocial behaviors in 1980 and a summary index of 8 abuse/dependence symptoms 4 years later (Windle, 1990) and a summary index of 21 symptoms 9 years later (Harford and Parker, 1994). The primary objec-

tive of the present study is to extend the coverage of the association between ASB and DSM-IV alcohol use disorders in the NLSY to a later follow-up period (1994); however, in comparison with prior studies, this study provides a more comprehensive assessment of DSM-IV alcohol symptoms within a structural equation modeling framework.

## Method

### Sample

The National Longitudinal Survey of Labor Market Experience in Youth (NLSY; Ohio State University, 1994), initiated in 1979, was a representative sample of 12,686 men and women aged 14 through 21 on January 1, 1979. The NLSY data were collected as a multistage probability sample, with an oversampling of black, Hispanic and economically disadvantaged nonblack and non-Hispanic youth and a cross-sectional sample designed to represent the military population (Frankel et al., 1983). The military sample ( $n = 1,280$ ) was dropped in 1985 and the oversampling of economically disadvantaged nonblack and non-Hispanic youth ( $n = 1,643$ ) was dropped in 1990. The present analysis is based on 7,326 respondents in the 1994 wave who provided complete information on each of the variables described below.

### Measures

*Outcome variables.* Estimates of current alcohol abuse and dependence are derived from a set of 22 symptom-item questions designed to operationalize the Diagnostic and

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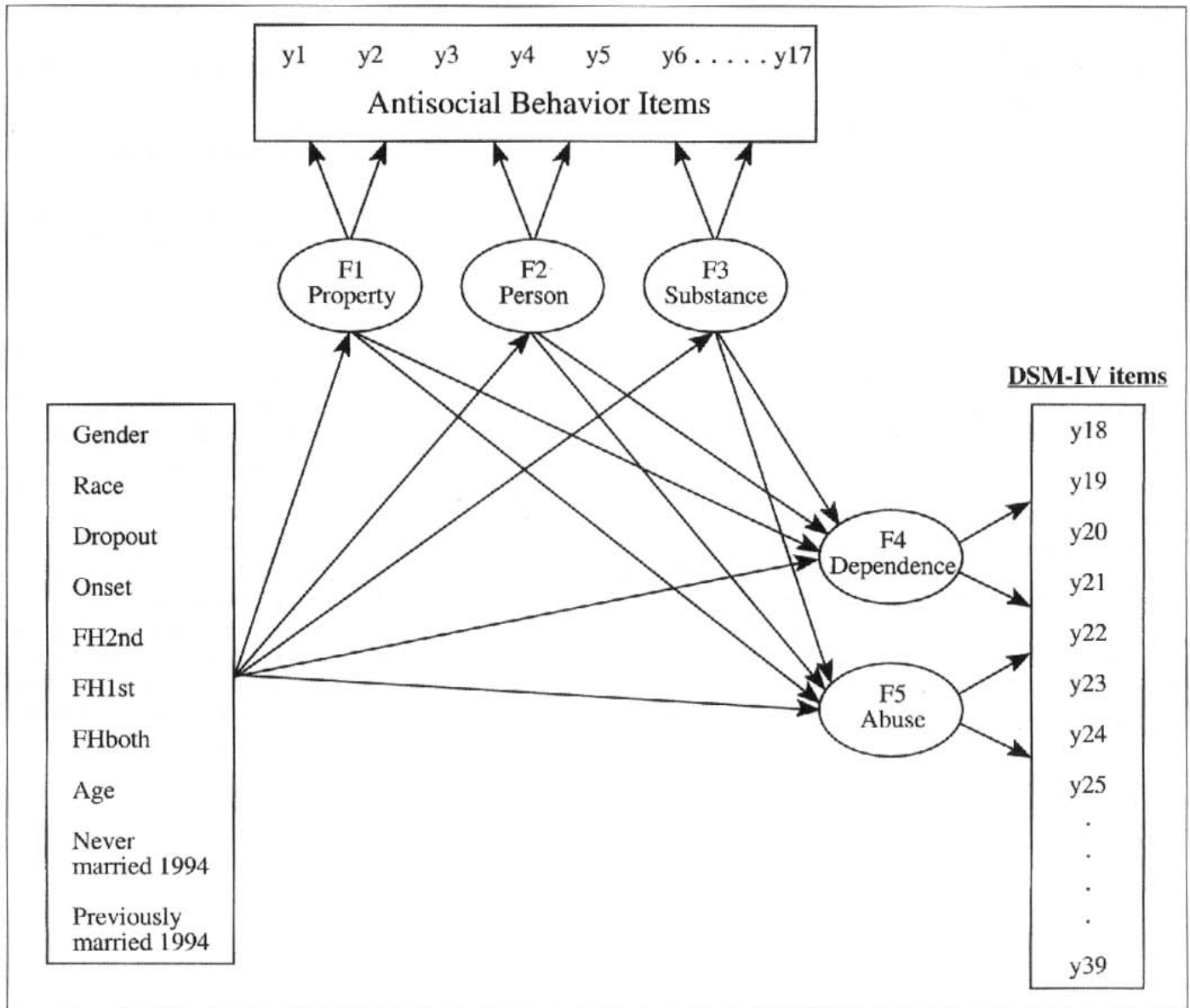


FIGURE 1. Structural equation model

Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV; American Psychiatric Association, 1994). The diagnoses derived from these symptom items have demonstrated good test-retest reliability (Grant et al., 1995) and population validity (Harford and Grant, 1994). Symptoms were dichotomized to 1 = one or more times in the past year and 0 = not present in the past year.

*Background variables.* Antisocial behavior, excluding the use of alcohol, is measured by 17 items administered in 1980 that assessed the frequency of various behaviors during the past year (shoplifting, stealing, property damage, fighting, use of force, use of marijuana and other drugs, drug trafficking). With the exception of use of marijuana, there were few responses for frequencies in excess of two or more times. Consequently, the items were dichotomized to

one or more times in the past year compared to not in the past year. Other background variables were family history of alcohol problems, early onset of drinking, age (in years), race, school dropout status and 1994 marital status. Family history of alcoholism (FHA) is measured by the 1988 question: "Have any of your relatives listed on this card been alcoholics or problem drinkers at any time in their lives?" Three dummy variables are considered for FHA: only first-degree relatives (FH1st); only second- or third-degree relatives (FH2nd3rd); first-, second- and third-degree relatives (FHall). Early onset of drinking is measured by the 1982 question: "How old were you when you first started drinking?" Early onset is scored as a dummy variable with early onset defined as starting to drink at age 15 or younger. Race is scored as a dummy variable defined as black compared to

all others. Dropping out of high school is measured as a dummy variable defined as not having completed high school by age 22. Two dummy variables were constructed for marital status in 1994 defined as "never married" and "separated or divorced," with being married as the referent category.

### Statistical analysis

Antisocial behaviors were related to the DSM-IV symptom items using the statistical technique of structural equation modeling (see, e.g., Jöreskog and Sörbom, 1979) generalized to categorical outcomes (see, e.g., Muthén, 1979, 1989). The present model is a special case of structural equation modeling: a multiple causes and multiple indicators (MIMIC) model in which one or more latent variables intervene between a set of observed background variables predicting a set of observed response variables. The structure of the full MIMIC model is shown in Figure 1. Analyses were carried out by Mplus (Muthén and Muthén, 1998). Based on the results of an exploratory factor analysis of the ASB items, a confirmatory factor analysis framework for three ASB factors—property offense, person offense, illicit substance involvement—was incorporated into the structural equation model. The model was further modified by including significant direct effects between each of the background variables and the ASB and DSM-IV items.

### Results

The demographic and background characteristics of the sample are distributed as follows: male, 48.8%; black, 30.2%; dropouts, 12.6%; early onset of alcohol use, 18.2%; never married (1994), 26.0%; previously married (1994), 18.7%; FH2nd3rd, 20.9%; FH1st, 15.2%; FHall, 11.8%.

There were several direct effects associated with gender and race, and their inclusion in the structural model provided important model improvement (the chi-square value of model misfit dropped significantly from 1,742 to 1,423 with a drop of only 13 degrees of freedom,  $p < .001$ ).

There were variations in the relationships between background variables and the three ASB factors (data not shown). Age had a negative relationship to property and person offenses, which is consistent with research that indicates decline of ASB with increasing age (Robins, 1966), and a positive relationship to illicit substance involvement. Male gender was related to property and person offenses but not related to illicit substance involvement. Family history of alcoholism contributed more strongly to person offenses and substance involvement than to property offenses.

The structural regression estimates, which are interpreted as partial regression coefficients just as in ordinary multiple regression, for each of the two alcohol factors are summarized in Table 1. When the effects of the other variables in

TABLE 1. Estimated effects of background variables and antisocial factors on alcohol abuse and dependence

|                               | Dependence       |     |              | Abuse             |     |              |
|-------------------------------|------------------|-----|--------------|-------------------|-----|--------------|
|                               | Estimate         | SE  | Standardized | Estimate          | SE  | Standardized |
| Property offense              | .08 <sup>†</sup> | .03 | .09          | .08 <sup>†</sup>  | .02 | .11          |
| Person offense                | .11 <sup>†</sup> | .03 | .11          | .09 <sup>†</sup>  | .02 | .11          |
| Illicit substance involvement | .15 <sup>†</sup> | .03 | .15          | .19 <sup>†</sup>  | .02 | .24          |
| Gender (male)                 | .46 <sup>†</sup> | .06 | .44          | .25 <sup>†</sup>  | .03 | .31          |
| Race (black)                  | .21 <sup>†</sup> | .06 | .20          | -.06              | .04 | -.08         |
| School dropout                | .57 <sup>†</sup> | .07 | .54          | .07               | .04 | .09          |
| Onset of alcohol use          | .01              | .06 | .01          | .10 <sup>†</sup>  | .03 | .12          |
| Family history1 <sup>a</sup>  | .14*             | .07 | .14          | .07*              | .03 | .09          |
| Family history2 <sup>b</sup>  | .20 <sup>†</sup> | .03 | .20          | .00               | .04 | .00          |
| Family history3 <sup>c</sup>  | .35 <sup>†</sup> | .08 | .34          | .09*              | .04 | .11          |
| Age                           | -.02             | .01 | -.04         | -.03 <sup>†</sup> | .01 | -.07         |
| Single                        | .39 <sup>†</sup> | .05 | .37          | .21 <sup>†</sup>  | .03 | .26          |
| Divorced                      | .14 <sup>†</sup> | .06 | .14          | .11 <sup>†</sup>  | .03 | .14          |
| R <sup>2</sup>                | .22              |     |              | .17               |     |              |

\* $p < .05$ ; <sup>†</sup> $p < .01$ .

<sup>a</sup>Only second- and/or third-degree blood relatives.

<sup>b</sup>Only first-degree blood relatives.

<sup>c</sup>First-, second- and third-degree blood relatives.

the model were controlled for, each of the three ASB factors significantly predicted alcohol dependence and abuse 14 years later. Being male, being single and being divorced/separated were related to both alcohol factors. Race and dropout status were related to alcohol dependence but not alcohol abuse. Early onset of drinking was related to alcohol abuse but not to alcohol dependence. Family history was related to dependence and evidenced stronger effects when compared to abuse. Age was unrelated to dependence and inversely related to abuse. Alcohol dependence had 22% of its variation explained by this set of covariates, compared to 17% for alcohol abuse.

### Discussion

The major findings in this 14-year prospective study indicated that both early illicit substance involvement and delinquency other than illicit substance involvement were associated with both alcohol-related outcome variables. Despite the strengths of the longitudinal design underlying the present findings, interpretations of the nature of the association in the present study are limited by the one-time assessment of ASB. Nor are we able to disentangle the effects of antisocial personality disorders, antisocial behaviors or associated comorbid conditions that may underlie the present findings. Despite these limitations, the present findings go beyond a simple relationship between ASB and alcohol use disorder. The strength of the association between person offense and both abuse and dependence was similar and significant, and person offense was characterized by strong influences from male gender, school dropout, early onset and positive family history—perhaps indicative of an alcoholic subtype (Cloninger et al., 1981).

The significant and negative associations between age and property and person offenses in the present study would suggest that the normative pattern of cessation over time would dissipate the relationship between early ASB and subsequent alcohol use disorders as the sample ages. The association between early ASB and alcohol use disorders 14 years later may simply represent continuity of an earlier developmental connection. Typically, only those persons with more serious conduct problems in childhood continue to display them into adulthood, and these are persons who are at highest risk for developing alcohol use disorders (Fleming et al., 1982; Mills and Noyes, 1984; Robins and Przybeck, 1985).

Early illicit substance involvement was strongly influenced by early onset and family history and had stronger associations with alcohol abuse than dependence. While it might be expected that early involvement in illicit substance abuse would predispose one to alcohol dependence, the evidence from this study points in another direction—alcohol abuse. Other studies have characterized alcohol abuse as a less severe pattern of hazardous drinking (Hasin and Paykin, 1999; Langenbucher and Martin, 1996; Muthén,

1995; Muthén et al., 1993a,b). Taken together, the present findings place some caveats on the hypothesized relationship between ASB and alcohol use disorders.

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