2005

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THE EFFECTS OF PARENTAL ALCOHOLISM AND CHILDHOOD CONDUCT DISORDER SYMPTOMS ON EARLY-, MIDDLE-, AND LATE-ADOLESCENCE-ONSET ALCOHOLISM IN YOUNG ADULTS.

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Introduction

The purpose of this study is to examine the effects of parental alcoholism and the symptoms for DSM-III-R conduct disorder (CD) on the development of alcoholism in a sample of 2502 young adults participating in the Collaborative Study on the Genetics of Alcoholism (COGA).

Previous studies have shown that parental alcoholism is a significant risk factor for the development of alcohol dependence in offspring (Bucholz et al., 2000; Kuperman et al, 1999; Schuckit, 1998). In addition to alcohol dependence, children of alcoholics are at greater risk for behavioral disinhibition manifested in externalizing disorders (Reich et al., 1993). Externalizing disorder, particularly CD and antisocial personality disorder (ASP), are the strongest risk factors of alcohol dependence (Kessler et al., 1997). Twin research has suggested that much of the covariation between alcohol dependence and antisocial behavior is due to a common genetic risk factor (Slutske et al., 1998).

Evidence suggests that externalizing behaviors such as CD are antecedent to rather than a result of alcohol use and abuse in adolescents. Kuperman et al. (2001) concluded that disruptive behavior diagnoses typically precede the initiation of substance use that, in turn, precedes the diagnosis of alcohol dependence in adolescents. A study of the transitions in drinking in adolescent females (Bucholz et al., 2000) found that conduct problems, as well as smoking and marijuana use, were consistent promoters of transitions to more severe drinking classes.

The goal is to determine which, if any, of the CD symptoms were antecedent to the onset of alcoholism and whether such symptoms augment the risk of parental alcoholism on the risk of alcoholism in young adult offspring.

Methods

Study subjects
Data were drawn from the COGA project (Begleiter et al., 1995); a multicenter, multistage family study being conducted at university centers across the US. The main purpose of the study is to assess genetic influences on the development of alcohol abuse and dependence. Index cases were ascertained from inpatient and outpatient chemical dependency treatment facilities and they and their family members were interviewed with a comprehensive psychiatric assessment instrument. The COGA sample also includes a comparison sample ascertained from a variety of sources without respect to any psychiatric disorder (including alcoholism) in any family member.

Assessment and Diagnosis
Individuals 18 years and older were assessed by trained interviewers with the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA; Bucholz et al., 1994). The SSAGA is designed to identify a broad range of psychiatric diagnoses using multiple criteria. The SSAGA also assesses physical and social manifestations of alcoholism and related disorders. Clinician review of interviews, family history information, and medical records (if available) demonstrated a high reliability of the diagnosis of alcohol dependence in adults (Nurnberger et al, 2001). All diagnoses were made using computerized algorithms.

Alcohol-Dependence Group
The sample was divided into four groups based on their age at onset of DSM-III-R alcohol dependence:

- the early-onset group (EA) developed alcoholism at age 15 or before;
- the middle-onset group (MA) developed alcoholism between ages 16 and 18;
- the late-onset group (LA) developed alcoholism between the ages of 19 and 24; and,
- the remaining subjects did not develop alcoholism by age 25 and served as the reference group (NO ALC).

Conduct Disorder Symptoms
The symptoms for CD are used to assess DSM-III-R criterion B for ASP. Eleven of the 12 symptoms had a prevalence rate greater than 1% and were chosen for analysis. For these analyses, the symptoms were not constrained to an onset prior to age 15; rather, the ages at onset reported in the direct interview were used to determine the temporal relation with alcohol dependence.

Statistical Analysis
Estimates of the effects of parental alcoholism and antecedent CD symptoms on alcohol-dependence group membership were made using multinomial logistic regression. Familial clustering in the data was accounted for using robust variance estimates (Hamilton, 2004).

Table 1. Characteristics of Young Adults by Alcohol-Dependence Group.

	Alcohol Dependence Group*				
Characteristics	**NO ALC**	**EA**	**MA**	**LA**	**Total**
# of Families	1077	82	254	139	1552
# of Young Adults	1796	114	389	203	2502
Sex, %					
Male	40.1	60.5	63.8	65.0	46.7
Female	59.9	39.5	36.3	35.0	53.3
Race, %					
White	71.6	87.7	85.4	81.8	75.3
Black	25.5	7.9	12.3	14.8	21.8
Other	2.9	4.4	2.3	3.5	2.9
Age at Interview, mean (SD)	21.0 (2.2)	21.5 (2.4)	21.1 (2.2)	22.8 (1.7)	21.2 (2.2)
# of Alcoholic Parents, %					
None	40.8	18.0	27.0	31.1	36.6
One, Mother	6.6	9.0	7.1	9.0	7.0
One, Father	40.0	47.2	42.0	42.4	40.8
Two	12.7	25.8	23.9	17.5	15.6
Comorbid Diagnoses, %					
CD	10.7	68.2	35.6	21.7	18.2
ASP	4.7	58.3	28.8	14.7	11.8
MDD	22.9	58.2	38.9	32.7	27.8
Any Anx.	3.5	12.6	7.9	4.5	4.7
Substance Use, %					
Daily Smoking	45.8	88.0	77.5	69.3	56.5
Marijuana Use	57.9	98.2	92.3	85.9	67.3
Drug Use	25.1	92.8	72.1	54.5	37.8
Substance Dependence, %					
Habitual Smoking	14.1	57.4	35.0	30.7	27.2
Marijuana Dependence	11.3	73.4	49.7	27.8	21.4
Drug Dependence	10.1	78.4	51.3	30.2	21.2

* NO ALC = no alcohol dependence; EA = early-adolescence (age 15 or earlier) onset of alcohol dependence; MA = middle-adolescence (ages 16 to 18) onset of alcohol dependence; and, LA = late-adolescence (ages 19 to 25) onset of alcohol dependence.

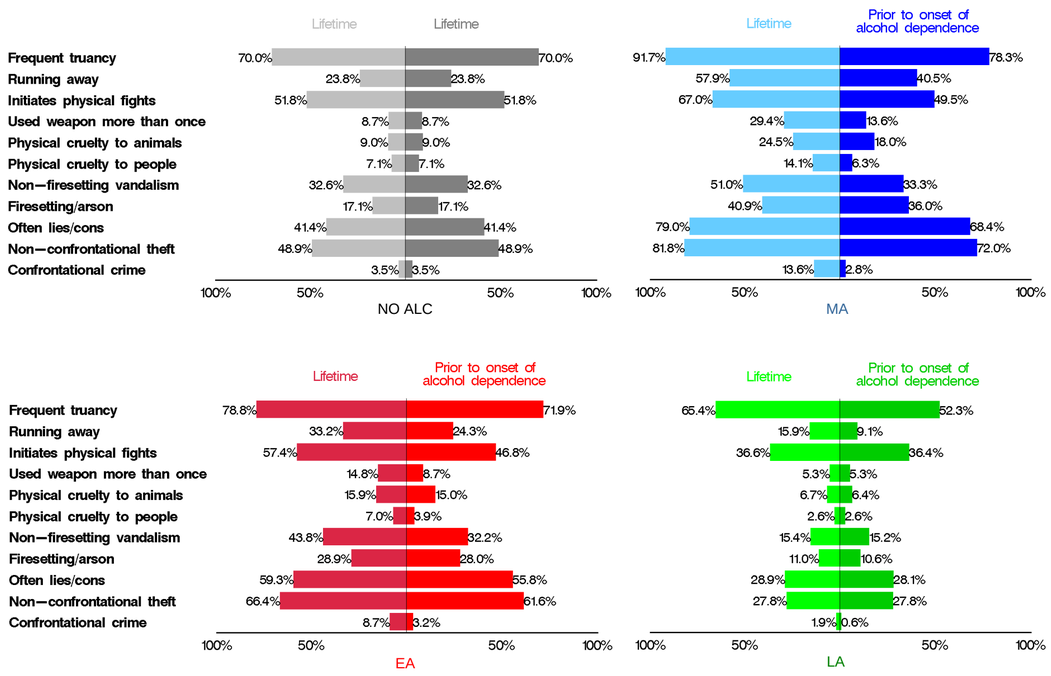
Table 2. Adjusted Odds Ratios† for Parental Alcoholism and Antecedent CD Symptoms from Multinomial Logistic Regression Model of Alcohol-Dependence Group Membership.

	Alcohol-Dependence Group*					
	EA		MA		LA	
Variable	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Sex, Male	**1.68**	**(1.01,2.77)**	**1.83**	**(1.37,2.45)**	**2.25**	**(1.57,3.21)**
# Alcoholic Parents						
One, Mother	2.52	(0.99,6.42)	1.20	(0.67,2.15)	1.63	(0.88,3.03)
One, Father	**2.24**	**(1.13,4.48)**	1.32	(0.95,1.84)	1.31	(0.89,1.94)
Two	**3.64**	**(1.66,8.01)**	**2.38**	**(1.53,3.70)**	1.64	(0.97,2.79)
Frequent truancy	1.61	(0.89,2.91)	**1.48**	**(1.10,2.01)**	1.17	(0.82,1.69)
Running away	**4.16**	**(2.45,7.05)**	**2.05**	**(1.42,2.96)**	**1.87**	**(1.18,2.98)**
Initiates physical fights	0.75	(0.46,1.23)	0.97	(0.73,1.29)	1.04	(0.74,1.46)
Used weapon more than one	1.33	(0.62,2.87)	0.89	(0.52,1.52)	0.92	(0.44,1.94)
Physical cruelty to animals	1.53	(0.73,3.22)	0.98	(0.64,1.51)	0.83	(0.45,1.52)
Physical cruelty to people	0.78	(0.25,2.44)	0.66	(0.30,1.42)	1.54	(0.69,3.45)
Non-firesetting vandalism	0.83	(0.48,1.42)	1.36	(0.98,1.88)	1.41	(0.93,2.14)
Firesetting or arson	**1.98**	**(1.08,3.62)**	**1.59**	**(1.11,2.28)**	1.06	(0.65,1.72)
Often lies or cons	**3.04**	**(1.78,5.20)**	**1.91**	**(1.42,2.56)**	1.31	(0.93,1.84)
Non-confrontational theft	**2.91**	**(1.72,4.94)**	**2.18**	**(1.63,2.91)**	**1.52**	**(1.06,2.16)**
Confrontational crime	0.86	(0.16,4.44)	1.66	(0.59,4.67)	0.47	(0.06,3.74)

†OR = Odds ratio; CI = Confidence interval; Statistically significant estimates are in **bold**.

* NO ALC = no alcohol dependence; EA = early-adolescence (age 15 or earlier) onset of alcohol dependence; MA = middle-adolescence (ages 16 to 18) onset of alcohol dependence; and, LA = late-adolescence (ages 19 to 25) onset of alcohol dependence.

Figure 1. Lifetime and Antecedent Rates of CD Symptom in Young Adults by Alcohol-Dependence Group*.



* NO ALC = no alcohol dependence; EA = early-adolescence (age 15 or earlier) onset of alcohol dependence; MA = middle-adolescence (ages 16 to 18) onset of alcohol dependence; and, LA = late-adolescence (ages 19 to 25) onset of alcohol dependence.

Results

The characteristics of the sample are given in Table 1. Subjects in the three alcohol-dependent groups were more likely to be male, white, and have two alcoholic parents. Comorbidity rates were significantly greater in all three alcohol-dependent groups compared to the base rates in the no-alcohol-dependence group. Subjects in the early-adolescence onset group had greater rates of comorbid diagnoses than subjects in the middle-adolescence onset and late-adolescence onset groups. There were substantially greater rates of smoking, marijuana use, and drug use in the alcohol-dependent groups with the early-adolescence onset group exhibiting the highest rates. Non-alcohol substance dependence was also significantly greater in the early-adolescence onset group.

The lifetime rates as well as the rates prior to onset of alcohol dependence for the 11 CD symptoms are shown in Figure 1. The rates of in the early-adolescence onset group were very similar to those in the NO ALC group with nearly all the CD symptoms antecedent to the alcoholism. In the middle-adolescence onset group, the majority of the CD symptoms occurred prior the onset of alcoholism. However, there was a large fraction of symptoms that occurred following the alcoholism, particularly aggressive symptoms (e.g., physical fighting, cruelty to animals, and confrontational crime). Other than truancy and physical fighting, the rates of CD in the LA group were very low compared to the other groups, and nearly all was subsequent to the alcoholism.

The results of the multinomial logistic regression of alcohol-dependence group membership is given in Table 2. Having two alcoholic parents significantly increased the odds of being in the early-adolescence onset and middle-adolescence onset groups but not in the late-adolescence onset group. Running away and non-confrontational theft were significant risk factors for all three groups while firesetting/arson and often lies/cons were significant risk factors for the early-adolescence onset and middle-adolescence onset groups. The effects of these CD symptoms were greatest in the early-adolescence onset group and decreased in each later-onset group.

Conclusions

These findings support previous research demonstrating a relationship between parental alcoholism and the development of alcohol dependence in adolescence. This effect, particularly of two alcoholic parents, is greatest in early adolescence and lessens as the offspring move into young adulthood. These findings also support previous research that demonstrated externalizing behaviors such as CD are antecedent to rather than a result of alcohol use and abuse in adolescents. In particular, non-aggressive CD symptoms typically precede the onset of alcohol dependence. This effect is also greatest in early adolescence and lessens as the offspring move into young adulthood. The lack of direct effects of parental alcoholism and CD symptoms in late adolescence and young adulthood suggests a more complex relationship between parental alcoholism and biological, social, environmental factors exists than was modeled herein.

Additional work with the COGA data incorporating the patterns of alcohol use across initiation, regular drinking, intoxication, abuse, and dependence with the patterns of conduct disorder symptoms as well as parental alcoholism and comorbidity and measures home and social environment are being conducted to gain a more complete picture of the development of alcoholism in adolescence.

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Acknowledgement

The Collaborative Study on the Genetics of Alcoholism (COGA) (Principal Investigator: H. Begleiter; Co-Principal Investigators: L. Bierut, H. Edenberg, V. Hesselbrock, Bernice Porjesz) includes nine different centers where data collection, analysis, and storage take place. The nine sites and Principal Investigators and Co-Investigators are: University of Connecticut (V. Hesselbrock); Indiana University (H. Edenberg, J. Nurnberger Jr., P.M. Conneally, T. Foroud); University of Iowa (R. Crowe, S. Kuperman); SUNY HSCB (B. Porjesz, H. Begleiter); Washington University in St. Louis (L. Bierut, J. Rice, A. Goate); University of California at San Diego (M. Schuckit); Howard University (R. Taylor); Rutgers University (J. Tischfield); Southwest Foundation (L. Almasy). Lisa Neuhold serves as the NIAAA Staff Collaborator. This national collaborative study is supported by the NIH Grant U10AA08403 from the National Institute on Alcohol Abuse and Alcoholism (NIAAA).

In memory of Theodore Reich, M.D., Co-Principal Investigator of COGA since its inception and one of the founders of modern psychiatric genetics, we acknowledge his immeasurable and fundamental scientific contributions to COGA and the field.