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# Educational Attainment is Predicted by the Timing of Alcohol Use Transitions, Not the Transitions Themselves



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# ABSTRACT

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- Adolescent substance use is associated with decreased educational attainment
  - Using an offspring-of-twins design, we examined whether this association remained after controlling for liability associated with low parental education and parental substance disorder history
  - 1363 offspring with Wave 1 ( $M=22.0$  years old) and Wave 2 ( $M=24.2$  years old) data who were either high school graduates or no longer in school at Wave 2.
  - Alcohol use, abuse, and dependence were assessed at Wave 1
  - Educational attainment was assessed at Wave 2
  - Multinomial logistic regression analyses predicting offspring education from each alcohol measure after controlling for parental education and substance history indicated that the timing of alcohol use transitions is more strongly associated with educational attainment than is the transition per se:
    - Only 6 of 24 alcohol use characteristics were associated with educational attainment after controlling for covariates
    - 21 of 24 early alcohol transitions were associated with reduced educational attainment after controlling for covariates
  - These results are in keeping with the hypothesis that the adoption of an anti-conventional lifestyle might play an important role in the association between early alcohol use transitions and educational attainment
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# INTRODUCTION

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- Adolescent substance use is associated with reduced educational attainment (e.g., King et al., 2006; Lynskey & Hall, 2000)
  - This association could be a reflection of familial liability (genetic and/or environmental) shared by the two processes
  - Using longitudinal data from an offspring-of-twins design, we examine whether offspring substance use at Wave 1 remains associated with offspring education at Wave 2 above and beyond the risk stemming from low parental education and family history of alcohol and drug dependence
-

# OFFSPRING OF TWINS DESIGN

- By including both the father's substance dependence history and that of his cotwin, the offspring-of-twins design provides a unique way to assess the contributions of varied levels of genetic *and* environmental risk:

Group	Zygoty	Father Status*	Cotwin Status*	Offspring Risk		
				Genetic	Envt.	% of Sample
High G, High E	MZ or DZ	+	+ or –	High	High	53.4%
High G, Low E	MZ	–	+	High	Low	11.3%
Mod. G, Low E	DZ	–	+	Medium	Low	10.7%
Low G, Low E	MZ or DZ	–	–	Low	Low	24.6%

- Genetic influences would yield a risk pattern in which  $1 = 2 > 3 > 4$
- Environmental influences would yield a risk pattern in which  $1 > 2 = 3 = 4$
- Assumes control for psychopathology in the second parent

\* + indicates alcohol/drug dependent, – indicates not alcohol/drug dependent

# OFFSPRING SAMPLE

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- Respondents were offspring of twin-fathers in the Vietnam Era Twin Registry (VET-R; a U.S. registry containing male-male twin pairs in which both members served in the military during the Vietnam-era)
  - 1525 offspring completed the wave 2 telephone diagnostic interview for either of two parallel offspring-of-twins studies:
  - The present analyses included 1363 offspring who were no longer in school at wave 2 or were high school graduates pursuing additional education (157 offspring in high school at Wave 2 were excluded; 5 others were dropped due to missing data)
    - **666** offspring who participated in the Twins as Parents Study, (TAP; Wave 2 data collected 2006)
      - This study oversampled offspring of drug dependent twins (drugs other than alcohol)
    - **697** offspring who participated in Children of Alcoholics Study (COA; Wave 2 data collected 2004)
      - This study oversampled offspring of alcohol dependent twins
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# OFFSPRING SAMPLE, cont.

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	Wave 1	Wave 2
<i>Age in years (range)</i>	22.0 (14-32)	24.2 (15-34)
<i>% Male</i>		47.7
<i>Education at Wave 2</i>	Not in School (n=922)	Still in School (n=441)
< 12 years	8.5	---
12 years	29.6	18.1
13-15 years	34.6	67.2
16+ years	27.3	14.7

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# OFFSPRING ALCOHOL USE

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	N	% of sample	<u>M</u> age of onset	% before age 15
Ever had alcohol	1192	87.5%	16.1	24.2%

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	N	% of users	<u>M</u> age of onset	% before age 18
Regular alcohol use	721	60.5%	18.9	31.5%
Ever been intoxicated	946	79.4%	17.2	56.5%
Ever had >24 drinks in 24 hrs.	105	8.8%	19.1	28.8%
Any DSM-IV Alc. Abuse Sx	417	35.0%	17.5	55.4%
Any DSM-IV Alc. Depend. Sx	788	66.1%	19.0	32.5%
DSM-IV Alc. Abuse	227	19.1%		
DSM-IV Alc. Dependence	206	17.3%		

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# PARENTAL SAMPLE

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- All offspring had a biological father who was interviewed for the COA/TAP study
  - 91% of the offspring had a biological or step/adoptive mother who completed an interview; a dummy variable indicating missing maternal data was included in all analyses
  - Mean age at COA/TAP interview:
    - Dads: 51.8 years (range: 43-61)
    - Moms: 48.9 years (range: 34-70)
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# PARENTAL SAMPLE, cont.

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<i>Parental Education</i>	Dad (n=1328)	Mom (n=1197)
< 12 years	2.4%	3.1%
12 years	31.8%	27.3%
13-15 years	39.8%	39.0%
16+ years	26.0%	30.6%

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- Paternal DSM-III-R AD: 45.2%
  - Paternal DSM-III-R DD: 24.2%
  - Maternal DSM-IV AD: 8.9%
  - Maternal heavy cannabis use (more than 150 times lifetime): 3.6%
-

# ANALYSES

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- Multinomial logistic regression analyses were used to examine whether offspring alcohol use and abuse/dependence remained associated with offspring educational attainment after controlling for parental alcohol dependence, drug dependence, and educational attainment
  - Preliminary analyses indicated that:
    - Paternal DD RRR > paternal AD RRR for offspring failure to complete high school
    - Paternal DD RRR = paternal AD RRR for offspring high school degree and for offspring completing some college
    - DD MZ uncle RRR = AD MZ uncle RRR for each level of offspring educational attainment
    - DD DZ uncle RRR = AD DZ uncle RRR for each level of offspring educational attainment
-

# RESULTS

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- As shown in **Table 1**, alcohol use at Wave 1 was not a strong predictor of differences in educational attainment at Wave 2
    - Having had a full drink of alcohol, having consumed more than 24 alcoholic beverages in a 24-hour period, and having a lifetime diagnosis of DSM-IV alcohol dependence were all predictive of failure to complete high school (RRRs: 2.14-3.25)
    - Those who had a DSM-IV alcohol abuse diagnosis were at increased risk of failing to complete college (RRR=1.83)
  - As shown in **Table 2**, the timing of alcohol use transitions was strongly associated with all levels of educational attainment
    - All early transitions were associated with an increased risk of failure to complete high school (RRRs: 3.88-11.53)
    - 5 of the 6 early transitions were associated with failure to continue education beyond high school (RRRs: 1.72-4.63)
    - 4 of the 6 early transitions were associated with failure to complete college (RRRs: 1.65-2.50)
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# TABLE 1:

## Alcohol Use Transitions

- Each model controlled for parental alcohol and drug history, parental education, maternal missing data, and offspring gender and current school enrollment (full models available in printout below)

### Educational Attainment

Model	< High School	High School	Some College
Had a full drink <sup>a</sup>	<b>2.45*</b> (1.04-5.78)	1.66 (0.74-3.74)	1.11 (0.49-2.51)
Regular Alc. Use <sup>a</sup>	0.53 <sup>t</sup> (0.28-1.03)	<b>0.50*</b> (0.34-0.74)	0.83 (0.58-1.20)
Intoxication <sup>a</sup>	0.98 (0.44-2.19)	<b>0.57*</b> (0.37-0.89)	0.90 (0.59-1.37)
>24 drks in 24-hrs <sup>a</sup>	<b>3.25*</b> (1.25-8.43)	1.46 (0.71-3.00)	1.63 (0.86-3.08)
DSM-IV Alc. Abuse <sup>a</sup>	1.01 (0.45-2.26)	1.08 (0.63-1.84)	<b>1.83*</b> (1.18-2.85)
DSM-IV Alc. Dep. <sup>a</sup>	<b>2.14*</b> (1.07-4.29)	0.76 (0.46-1.25)	0.96 (0.62-1.49)

<sup>a</sup> risk relative to offspring with 16+ years of education, after controlling for covariates

\* p < .05      <sup>t</sup> p < .10

## TABLE 2:

# “Early” Alcohol Use Transitions

- Each model controlled for parental alcohol and drug history, parental education, maternal missing data, and offspring gender and current school enrollment (full models available in printout below)

### Educational Attainment

Model	< High School	High School	Some College
Initiation < age 15 <sup>a</sup>	<b>3.88*</b> (2.06-7.29)	1.02 (0.65-1.60)	1.07 (0.72-1.59)
Reg. Use < age 18 <sup>a</sup>	<b>5.80*</b> (2.37-14.22)	<b>1.96*</b> (1.15-3.36)	<b>2.04*</b> (1.30-3.18)
Intox. < age 18 <sup>a</sup>	<b>10.66*</b> (4.04-28.14)	<b>1.72*</b> (1.13-2.62)	<b>1.65*</b> (1.15-2.38)
Max. Cons. < age 18 <sup>a</sup>	<b>11.53*</b> (5.53-24.04)	<b>4.63*</b> (2.83-7.57)	<b>2.25*</b> (1.44-3.51)
1 <sup>st</sup> Ab. Sx < age 18 <sup>a</sup>	<b>5.71*</b> (1.96-16.62)	<b>2.03*</b> (1.05-3.95)	1.34 (0.76-2.35)
1 <sup>st</sup> Dep. Sx < age 18 <sup>a</sup>	<b>7.39*</b> (3.39-16.11)	<b>3.16*</b> (1.79-5.59)	<b>2.50*</b> (1.52-4.13)

<sup>a</sup> risk relative to offspring with 16+ years of education, after controlling for covariates

\* p < .05      † p < .10



# CONCLUSIONS

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- The present analyses:
    - Confirm that the association between alcohol use and education is not entirely explained by shared familial liability
    - Suggest that the timing of alcohol use transitions is more strongly associated with educational attainment than is the transition per se. Early alcohol use transitions are predictive of reduced educational attainment.
  - These results are in keeping with the hypothesis that the adoption of an anti-conventional lifestyle might play an important role in the association between early alcohol use transitions and educational attainment
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# LIMITATIONS AND FUTURE DIRECTIONS

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- We are unable to definitively establish direction of causation
  - Early school performance (prior to alcohol initiation) was not incorporated into the present analyses
  - Formal education is ongoing for some offspring (Wave 3 data collection is complete for COA and is scheduled to begin this spring for TAP; these data should further clarify educational attainment)
  - Most offspring are still within the peak period of risk for substance abuse/dependence; Wave 3 data will further clarify substance use
  - The present analyses do not take into account other substance use or remission vs. persistence of substance use/problems
  - Ongoing assessments of early adult transitions such as marriage, parenthood, and employment will be incorporated in future analyses of both education and substance use/abuse/dependence
-

# CITATIONS

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- King KM, Meehan BT, Trim RS, Chassin L (2006). Marker or mediator? The effects of adolescent substance use on young adult educational attainment. *Addiction*: 101:1730-1740.
- Lynskey M, Hall W (2000). The effects of adolescent cannabis use on educational attainment: A review. *Addiction*: 95:1621-1630.

# DISCLOSURES

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- The authors have no financial relationships that related to the topic of this presentation.
  - The present work was supported by multiple NIH grants: DA14363, AA11667, AA07728, AA11998
-

**Full**

**Multinomial**

**Logistic**

**Regression**

**Models**

# Alcohol Initiation

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Had a full drink <sup>a</sup></b>	<b>2.45* (1.04-5.78)</b>	<b>1.66 (0.74-3.74)</b>	<b>1.11 (0.49-2.51)</b>
Dad AD or DD	DD: 0.48 <sup>t</sup> (0.20-1.12) AD: 0.51 (0.22-1.16)	0.68 (0.32-1.45)	0.66 (0.31-1.44)
Mom AD	0.45 <sup>t</sup> (0.20-1.04)	0.70 (0.31-1.55)	0.90 (0.42-1.96)
Dad <16 yrs educ.	0.49 <sup>t</sup> (0.23-1.04)	0.73 (0.35-1.55)	0.92 (0.43-1.94)
Mom <16 yrs educ.	<b>0.30* (0.13-0.68)</b>	0.54 (0.24-1.21)	0.82 (0.36-1.88)
Male	<b>0.53* (0.31-0.89)</b>	0.75 (0.46-1.21)	0.99 (0.59-1.66)
In school	2.24 <sup>t</sup> (0.94-5.37)	<b>11.56* (5.13-26.05)</b>	<b>3.85* (1.67-8.92)</b>

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# Regular Alcohol Use

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Regular Alc. Use <sup>a</sup></b>	<b>0.53<sup>t</sup> (0.28-1.03)</b>	<b>0.50* (0.34-0.74)</b>	<b>0.83 (0.58-1.20)</b>
Dad AD or DD	<b>DD: 3.27* (1.38-7.75)</b> AD: 0.82 (0.29-2.29)	1.27 (0.81-1.98)	1.24 (0.84-1.83)
Mom AD	2.34 <sup>t</sup> (0.99-5.55)	<b>2.04* (1.01-4.11)</b>	1.70 <sup>t</sup> (0.91-3.15)
Dad < 16 yrs educ.	1.71 (0.78-3.76)	<b>1.88* (1.20-2.96)</b>	<b>1.50* (1.01-2.23)</b>
Mom < 16 yrs educ.	<b>3.90* (1.57-9.73)</b>	<b>2.63* (1.67-4.15)</b>	<b>1.60* (1.10-2.32)</b>
Male	<b>2.08* (1.15-3.77)</b>	<b>2.28* (1.58-3.28)</b>	<b>1.56* (1.12-2.18)</b>
In school	<b>0.10* (0.01-0.81)</b>	1.23 (0.74-2.04)	<b>4.46* (2.93-6.78)</b>

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# Ever Been Intoxicated

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Intoxication <sup>a</sup></b>	<b>0.98 (0.44-2.19)</b>	<b>0.57* (0.37-0.89)</b>	<b>0.90 (0.59-1.37)</b>
Dad AD or DD	<b>DD: 3.01* (1.27-7.13)</b> AD: 0.74 (0.27-2.04)	1.20 (0.77-1.86)	1.22 (0.83-1.79)
Mom AD	<b>2.35* (1.00-5.54)</b>	<b>2.07* (1.04-4.11)</b>	1.69 <sup>t</sup> (0.91-3.13)
Dad < 16 yrs educ.	1.78 (0.81-3.89)	<b>1.92* (1.22-3.01)</b>	<b>1.51* (1.02-2.25)</b>
Mom < 16 yrs educ.	<b>3.97* (1.59-9.89)</b>	<b>2.64* (1.67-4.18)</b>	<b>1.60* (1.10-2.32)</b>
Male	<b>1.97* (1.09-3.55)</b>	<b>2.17* (1.51-3.11)</b>	<b>1.53* (1.10-2.13)</b>
In school	<b>0.12* (0.02-0.89)</b>	1.33 (0.81-2.18)	<b>4.57* (3.02-6.91)</b>

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# Consumed 25+ Drinks in 24-hours

## Offspring Educational Attainment

	< High School	High School	Some College
>24 drks in 24-hrs <sup>a</sup>	<b>3.25*</b> (1.25-8.43)	<b>1.46</b> (0.71-3.00)	<b>1.63</b> (0.86-3.08)
Dad AD or DD	<b>DD: 2.87*</b> (1.21-6.81) AD: 0.69 (0.25-1.92)	1.13 (0.73-1.76)	1.18 (0.80-1.74)
Mom AD	2.38 <sup>t</sup> (0.99-5.69)	<b>2.04*</b> (1.02-4.08)	1.70 <sup>t</sup> (0.92-3.16)
Dad < 16 yrs educ.	1.79 (0.81-3.93)	<b>1.97*</b> (1.25-3.10)	<b>1.51*</b> (1.01-2.25)
Mom < 16 yrs educ.	<b>3.86*</b> (1.55-9.64)	<b>2.56*</b> (1.62-4.02)	<b>1.58*</b> (1.09-2.30)
Male	1.62 (0.85-3.08)	<b>2.08*</b> (1.43-3.00)	<b>1.44*</b> (1.03-2.03)
In school	<b>0.12*</b> (0.02-0.92)	1.43 (0.87-2.34)	<b>4.68*</b> (3.11-7.04)

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10



# DSM-IV Alcohol Abuse

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Alcohol abuse <sup>a</sup></b>	<b>1.01 (0.45-2.26)</b>	<b>1.08 (0.63-1.84)</b>	<b>1.83* (1.18-2.85)</b>
Dad AD or DD	<b>DD: 3.04* (1.29-7.16)</b> AD: 0.74 (0.27-2.04)	1.16 (0.75-1.79)	1.21 (0.82-1.78)
Mom AD	2.27 <sup>t</sup> (0.97-5.33)	<b>1.99* (1.00-3.97)</b>	1.68 <sup>t</sup> (0.91-3.10)
Dad < 16 yrs educ.	1.78 (0.81-3.92)	<b>1.98* (1.26-3.12)</b>	<b>1.56* (1.05-2.32)</b>
Mom < 16 yrs educ.	<b>3.95* (1.58-9.87)</b>	<b>2.58* (1.64-4.05)</b>	<b>1.58* (1.08-2.30)</b>
Male	<b>1.96* (1.09-3.54)</b>	<b>2.14* (1.49-3.07)</b>	<b>1.49* (1.07-2.08)</b>
In school	<b>0.12* (0.02-0.90)</b>	1.43 (0.87-2.35)	<b>4.85* (3.20-7.34)</b>

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# DSM-IV Alcohol Dependence

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Alcohol depend. <sup>a</sup></b>	<b>2.14*</b> (1.07-4.29)	<b>0.76</b> (0.46-1.25)	<b>0.96</b> (0.62-1.49)
Dad AD or DD	<b>DD: 2.81*</b> (1.18-6.69) AD: 0.64 (0.22-1.82)	1.19 (0.76-1.85)	1.23 (0.84-1.82)
Mom AD	2.36 <sup>t</sup> (0.99-5.58)	<b>2.00*</b> (1.01-3.99)	1.68 <sup>t</sup> (0.91-3.12)
Dad < 16 yrs educ.	1.95 (0.87-4.37)	<b>1.95*</b> (1.24-3.08)	<b>1.54*</b> (1.03-2.30)
Mom < 16 yrs educ.	<b>3.94*</b> (1.57-9.84)	<b>2.59*</b> (1.64-4.08)	<b>1.58*</b> (1.08-2.29)
Male	1.77 <sup>t</sup> (0.98-3.22)	<b>2.20*</b> (1.53-3.15)	<b>1.54*</b> (1.11-2.15)
In school	<b>0.13*</b> (0.02-0.96)	1.39 (0.85-2.28)	<b>4.62*</b> (3.06-6.97)

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# First Full Drink Before Age 15

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Early Initiation <sup>a</sup></b>	<b>3.88*</b> (2.06-7.29)	<b>1.02</b> (0.65-1.60)	<b>1.07</b> (0.72-1.59)
Dad AD or DD	<b>DD: 3.01*</b> (1.29-7.04) AD: 0.67 (0.24-1.86)	1.15 (0.74-1.79)	1.20 (0.82-1.77)
Mom AD	1.95 (0.80-4.77)	<b>2.01*</b> (1.01-4.00)	1.66 (0.90-3.09)
Dad < 16 yrs educ.	2.08 <sup>t</sup> (0.93-4.62)	<b>1.98*</b> (1.26-3.11)	<b>1.52*</b> (1.02-2.26)
Mom < 16 yrs educ.	<b>3.82*</b> (1.50-9.70)	<b>2.57*</b> (1.63-4.04)	<b>1.59*</b> (1.09-2.31)
Male	1.74 <sup>t</sup> (0.95-3.18)	<b>2.14*</b> (1.49-3.07)	<b>1.53*</b> (1.10-2.13)
In school	<b>0.12*</b> (0.02-0.97)	1.41 (0.86-2.31)	<b>4.62*</b> (3.07-6.95)

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# Regular Use Before Age 18

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Early Reg. Use <sup>a</sup></b>	<b>5.80*</b> (2.37-14.22)	<b>1.96*</b> (1.15-3.36)	<b>2.04*</b> (1.30-3.18)
Dad AD or DD	DD: 2.99 (0.73-12.21) AD: 0.69 (0.14-3.34)	1.06 (0.58-1.94)	1.10 (0.66-1.83)
Mom AD	1.96 (0.61-6.37)	2.27 <sup>t</sup> (0.96-5.41)	1.45 (0.65-3.23)
Dad < 16 yrs educ.	<b>3.40*</b> (1.01-11.38)	<b>2.04*</b> (1.14-3.64)	<b>1.78*</b> (1.10-2.90)
Mom < 16 yrs educ.	<b>3.90*</b> (1.30-11.74)	<b>2.75*</b> (1.52-4.99)	<b>1.74*</b> (1.10-2.75)
Male	1.53 (0.65-3.58)	<b>2.21*</b> (1.37-3.55)	1.30 (0.87-1.93)
In school	0.18 (0.02-1.56)	0.79 (0.39-1.58)	<b>2.82*</b> (1.71-4.62)

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# Intoxication Before Age 18

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Early Intoxication <sup>a</sup></b>	<b>10.66* (4.04-28.14)</b>	<b>1.72* (1.13-2.62)</b>	<b>1.65* (1.15-2.38)</b>
Dad AD or DD	DD: 2.18 (0.83-5.71) AD: 0.70 (0.24-2.01)	1.38 (0.82-2.32)	1.14 (0.74-1.75)
Mom AD	1.82 (0.69-4.82)	1.69 (0.79-3.62)	1.65 (0.87-3.13)
Dad < 16 yrs educ.	2.25 <sup>t</sup> (0.95-5.34)	<b>2.19* (1.31-3.66)</b>	<b>1.86* (1.20-2.87)</b>
Mom < 16 yrs educ.	<b>3.13* (1.22-8.03)</b>	<b>2.34* (1.41-3.89)</b>	<b>1.76* (1.17-2.64)</b>
Male	1.77 <sup>t</sup> (0.93-3.38)	<b>2.18* (1.46-3.27)</b>	1.41 <sup>t</sup> (0.97-2.03)
In school	<b>0.12* (0.02-0.94)</b>	1.13 (0.63-2.03)	<b>4.11* (2.59-6.52)</b>

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# Maximum 24-hour Consumption Before Age 18

## Offspring Educational Attainment

< High School

High School

Some College

Early Max. Cons. <sup>a</sup>	11.53* (5.53-24.04)	4.63* (2.83-7.57)	2.25* (1.44-3.51)
Dad AD or DD	<b>DD: 3.30*</b> (1.43-7.59) AD: 0.78 (0.29-2.11)	1.16 (0.74-1.83)	1.17 (0.80-1.73)
Mom AD	2.10 (0.84-5.27)	1.99 <sup>t</sup> (0.98-4.05)	1.73 <sup>t</sup> (0.92-3.23)
Dad < 16 yrs educ.	2.01 (0.86-4.72)	<b>2.06*</b> (1.29-3.29)	<b>1.57*</b> (1.06-2.34)
Mom < 16 yrs educ.	<b>2.98*</b> (1.19-7.45)	<b>2.35*</b> (1.48-3.73)	<b>1.52*</b> (1.05-2.20)
Male	<b>2.13*</b> (1.14-3.96)	<b>2.31*</b> (1.59-3.36)	<b>1.62*</b> (1.16-2.26)
In school	<b>0.06*</b> (0.01-0.52)	0.97 (0.59-1.59)	<b>3.84*</b> (2.52-5.86)

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# First DSM-IV Abuse Symptom Before Age 18

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Early Abuse Sx <sup>a</sup></b>	<b>5.71* (1.96-16.62)</b>	<b>2.03* (1.05-3.95)</b>	<b>1.34 (0.76-2.35)</b>
Dad AD or DD	DD: 3.25 (0.76-13.97) AD: 0.71 (0.13-3.89)	1.40 (0.54-3.59)	1.12 (0.52-2.38)
Mom AD	0.72 (0.13-3.87)	1.61 (0.49-5.31)	1.77 (0.60-5.28)
Dad < 16 yrs educ.	1.84 (0.56-6.11)	1.43 (0.67-3.06)	1.33 (0.69-2.55)
Mom < 16 yrs educ.	<b>3.94* (1.03-15.07)</b>	1.97 <sup>t</sup> (0.92-4.23)	1.82 <sup>t</sup> (0.98-3.37)
Male	1.62 (0.62-4.21)	1.33 (0.71-2.52)	1.08 (0.62-1.90)
In school	0.26 (0.03-2.39)	0.79 (0.29-2.12)	<b>3.37* (1.63-7.00)</b>

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10

# First DSM-IV Dependence Symptom Before Age 18

## Offspring Educational Attainment

	< High School	High School	Some College
<b>Early Dep. Sx <sup>a</sup></b>	<b>7.39* (3.39-16.11)</b>	<b>3.16* (1.79-5.59)</b>	<b>2.50* (1.52-4.13)</b>
Dad AD or DD	<b>DD: 3.21* (1.15-8.93)</b> AD: 0.98 (0.30-3.14)	1.22 (0.69-2.17)	1.22 (0.75-1.98)
Mom AD	1.27 (0.44-3.66)	1.41 (0.63-3.15)	1.12 (0.53-2.35)
Dad < 16 yrs educ.	2.41 <sup>t</sup> (0.96-6.01)	<b>2.36* (1.33-4.17)</b>	<b>1.82* (1.13-2.93)</b>
Mom < 16 yrs educ.	<b>3.42* (1.24-9.42)</b>	<b>2.87* (1.60-5.13)</b>	1.53 <sup>t</sup> (0.98-2.40)
Male	1.94 <sup>t</sup> (0.95-3.95)	<b>1.80* (1.14-2.85)</b>	1.45 <sup>t</sup> (0.96-2.19)
In school	0.12 <sup>t</sup> (0.01-1.01)	0.85 (0.43-1.66)	<b>3.24* (1.95-5.38)</b>

<sup>a</sup> risk relative to offspring with 16+ years of education

\* p < .05

<sup>t</sup> p < .10