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The Link between Mother and Adolescent Substance Use: Intergenerational Findings from the British Cohort Study

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Abstract

The objective of this study was to identify mother, family, and individual factors associated with adolescent alcohol, tobacco, and marijuana use using mother and child self-reports. Adolescents aged 12–15 (*N*=276) and their mothers who were participants in the British Cohort Study (BCS; born 1970) were both surveyed when mothers were 34 years old. Predictors included mother's substance use as well as characteristics of the child (gender, age, conduct problems) and family (social class, two-parent family, parent-adolescent conflict). Outcome variables were adolescent alcohol, cigarette, and marijuana use. Child characteristics were predictive, with older children more likely to engage in all behaviors. After controlling for other predictors, mothers' current drinking frequency and problems (i.e., CAGE 1+) predicted adolescent ever and sometimes/regular drinking; mothers' marijuana use was a marginally significant predictor of adolescent marijuana use. Results suggest that mothers' substance use is an important component of adolescent use, even after accounting for characteristics of the child and the intergenerational family context.

Keywords

parental substance use; mothers; adolescents; alcohol; drinking; marijuana/cannabis; tobacco

Introduction

A large body of literature has explored family factors that may contribute to the intergenerational transmission of substance use. This research suggests that families can shape adolescent alcohol and drug use through a number of pathways including parental human capital resources, parent-child interactions and relationships, and behavior modeling (Vakalahi, 2001). Positive family relationships, such as parent-child closeness, are linked to less substance use whereas parent-child conflict is associated with greater substance use (Hawkins et al., 1992; Kuntsche & Silbereisen, 2004). In addition, parental educational and other resources have been linked to youth substance use (e.g., Koning et al., 2010; Maggs et al., 2008; Melotti et al., 2011). Parental modeling and other intergenerational transmission mechanisms are also important, given the large body of research suggesting that parents who engage in heavy drinking and use drugs are more likely to have children who drink alcohol and use drugs themselves (Donovan et al., 2004; Dooley & Prause, 2007; Fawzy, 1983; Osborne & Berger, 2009; Zucker et al., 2003).

Although associations between parent and child substance use have been well-documented, extant research is unclear about whether this association remains after accounting for

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confounding factors that may be correlated with both parental and child substance use. In other words, it is uncertain whether parental substance use itself matters (e.g., having available substances or modeling alcohol and drug use) or whether other factors—such as socioeconomic status or family relations—account for this association. Whereas many studies continue to find a robust association after controlling for a host of family and individual characteristics (e.g., Hemphill et al., 2011), others find that accounting for these factors reduces the association between parent and child substance use to non-significance (e.g., Koning et al., 2010). In addition, a link between parent and youth substance use has been found for some substances, but not others, once control variables are included in the models (Macleod et al., 2008; Schinke et al., 2008).

The present study builds on and advances this literature by testing the extent to which mothers' substance use is associated with the substance use of their adolescent children using self-reports from both generations. We add to the literature in three primary ways. First, we control for a number of family factors to better understand whether the link between parental and youth substance use remains after accounting for factors predictive of substance use for both generations. Second, we test the intergenerational linkages across the three most commonly-used substances (i.e., alcohol, cigarettes, and marijuana) rather than focusing on only one type of substance use. Third, we utilize self-report measures of substance use from both mothers and adolescents, which enables us to get more accurate information from each generation and reduces single-reporter bias. Understanding predictors of early substance use is critical in light of research demonstrating that early onset of alcohol and drug use predicts substance use and disorders in late adolescence and young adulthood (Agrawal et al., 2006; Clark et al., 2005; Dooley et al., 2005; Grant and Dawson, 1997).

Method

Data are from the British Cohort Study (BCS), an ongoing birth cohort study that sampled all individuals in Britain who were born in one week in 1970 (Butler et al., 1985; Bynner et al., 2000; Schoon, 2006). After an initial assessment of 16,571 infants (96% of live births), follow-ups were conducted at ages 5, 10, 16, 26, 30, 34, and 38. Multiple sources of data were collected. Parent data in the present analyses were obtained from the primary BCS cohort members in 2004 when they were age 34 (N=9316; n=5039 women; 70% retention excluding emigrants and deceased). At age 34, 15% (N=772) of BCS women had at least one biological or adopted child aged 12 to 15 years old (born 1989–1992) who was living with them[1], 49% of whom (N=375) were selected for a sub-study about parents and children. Of those selected, 36 were missing all parent or child data, 60 were missing data on covariates of interest, and 3 lacked parent report and child self-reports for the same child, yielding a final analytic sample size of 276 (74% of those eligible). Data comprised mother reports (interview and self-completion) of demographics, parent-child conflict, and child temperament; and adolescent reports (self-completion) of their own attitudes and behaviors (see also Simmonds et al., 2007). Only the eldest child of each mother was included.

Measures

Adolescent substance use outcomes—Adolescents were asked how often they used alcohol, cigarettes, and marijuana, with response options of (a) *I have never drunk alcohol;* (b) *I have drunk alcohol once or twice only;* (c) *I used to drink alcohol but I don't now;* (d) *I sometimes drink alcohol, but I don't drink alcohol every week;* and (e) *I drink alcohol regularly, once a week or more*. This measure of drinking frequency was used to derive

[1]A small number of resident fathers (n=81) had children aged 12 to 15. Analyses focused only on mothers due to the smaller sample of fathers. Mother and father data were not combined due to potential differences in the impact of mother and father substance use.

primary dichotomous dependent variables in which youth who self-reported that they ever drank alcohol (i.e., responded *b–e*, coded 1) were compared those who never drank alcohol (i.e., responded *a*, coded 0). Those who drank alcohol sometimes or regularly (i.e., *d–e*, coded 1) were compared to those who drank less often (i.e., *a–c*, coded 0). Other substances were coded using the same response scale as alcohol. Adolescents who reported ever using cigarettes or ever using marijuana (coded 1) were compared to those who had never used the substance (coded 0).

Mothers' substance use—Mothers' current drinking frequency (i.e., how often she has an alcoholic drink of any kind) was reported on a scale of 0=*never had an alcoholic drink*, 1=*never nowadays*, 2=*less often or only on special occasions*, 3=*two to three times a month*, 4=*once a week*, 5=*two to three days a week*, 6=*on most days*. Mothers' problem drinking was measured with the CAGE (Bradley et al., 1998; Ewing, 1984; Liskow et al., 1995; Mayfield et al., 1974), which asked mothers whether they had ever experienced 4 alcohol-related symptoms in their lifetime and, if so, whether the symptoms had occurred in the past year. Responses were coded to contrast those who reported one or more alcohol problems in the prior year (coded 1) with those reporting no problems in the prior year (coded 0). Mothers' frequency of cigarette use was coded as 0=*has never smoked cigarettes*, 1=*used to smoke cigarettes but does not now*, 2=s*mokes cigarettes occasionally but not every day*, 3=*smokes cigarettes every day*. Mothers' frequency of marijuana use was coded as 0=*has never tried cannabis*, 1=*never nowadays*, 2=*less often or only on special occasions*, 3=*once a month*, 4=*two or three times a month*, 6=*two or three days a week*, 7=*most days*.

Adolescent characteristics—Adolescent controls were gender (male [1] vs. female [0]), age (14–15 years [1] vs. 12–13 years [0]), and conduct problems, measured with the conduct problems subscale of the Strengths and Difficulties questionnaire (α=.75; Goodman, 1997) as reported by the mothers. The scale is the sum of five items with response options ranging from 0=*not true* to 2=*certainly true*.

Family characteristics—Family social class/employment was coded based on two measures. First, The Registrar General's social class measure, a categorization of six social groups based on current occupational attainment, was used to classify mothers and their partners into skilled versus unskilled/partly skilled occupations (Rose & Pevalin, 2001). The parent/guardian with the highest occupational status was used to determine the social class of the family. In addition, a dichotomous variable captured if the parent/guardian was employed or not employed (i.e., unemployed, disabled, or looking after the family). These measures were combined to indicate non-manual (including professional/managerial) status [reference category], manual status, or non-employment. Living situation was included with adolescents living with two parents coded as 1 (all else=0). Last, parent-adolescent conflict was assessed with the conflict scale of the Child-Parent Relationship Scale-Short Form (Pianta, 1992). The scale was created by summing the 7 items (α=.86; e.g., "My child easily becomes angry at me"), with response options for each item ranging from 0=*definitely does not apply* to 4=*definitely applies to me*.

Results

Descriptive statistics regarding predictor and outcome variables are shown in Table 1. Although the current sample of adolescents is not nationally representative, the substance use patterns are generally consistent with those of the UK adolescent population as a whole. [2] Mothers of young adolescents included in the analyses presented here were similar to other women in the BCS 1970 cohort: There were no significant differences for marijuana use or CAGE scores. However, mothers of young adolescents were more likely to be daily

cigarette smokers than other women. Logistic regression analyses were used to predict adolescent substance use as a function of adolescent gender, age, and conduct problems; of family social class, mothers' employment, two-parent family status, and parent-adolescent conflict; and of mothers' substance use. Indicators of mothers' substance use were tested in separate models, due to collinearity between the two indicators of alcohol use and problems, and our interest in testing domain-specific transmission of substance use. Results shown are multivariate, due to our primary interest in whether the link between maternal and youth substance use remained after accounting for other individual and family factors.

With regards to predicting adolescent drinking (see Table 2), while controlling for the adolescent and family characteristics, adolescents whose mothers reported at least one alcohol problem in the prior year as indexed by the CAGE had greater odds of ever and of sometimes drinking. In these multivariate models, none of the other adolescent or family predictors was significant, with the exception of age, with 14–15 year old adolescents showing a much greater likelihood of both ever drinking and of sometimes drinking than 12–13 year old adolescents. Adolescents with more conduct problems had marginally significant greater odds of ever drinking ($p<.10$) and adolescents in two-parent families had marginally significant greater odds of ever drinking ($p<.10$). In additional models (not tabled), adolescents whose mothers drank more frequently also evidenced greater odds of ever drinking (OR=1.44, CI=[1.18, 1.76], $p<.001$) and of sometimes drinking (OR=1.39, CI=[1.15, 1.69], $p<.001$).

In terms of predicting adolescents' likelihood of ever smoking cigarettes, while controlling for adolescent and family characteristics, mothers' smoking did not predict the odds of adolescent smoking. In these multivariate models, none of the family predictors was significant, but the adolescent predictors were: Boys were less likely, and 14–15 year olds were more likely, to have smoked. Conduct problems approached significance ($p<.10$) as a positive predictor of ever using cigarettes.

Finally, in reference to predicting the likelihood of adolescents ever having used marijuana, while controlling for adolescent and family characteristics, mothers' marijuana use was a marginally significant predictor of a greater likelihood of adolescent marijuana use ($p<.10$). In a separate model (not tabled), the frequency of mothers' current marijuana use was a marginally significant predictor of adolescent marijuana use (OR=1.32, CI=[0.99, 1.76], $p<.10$). None of the family predictors was significant. The relatively older adolescents were more likely to have used marijuana. Conduct problems were marginally significant as a positive predictor of ever using marijuana ($p<.10$).

Discussion

There is little doubt that as a psychosocial system the family contributes extensively to adolescent substance use (Hawkins et al., 1992; Kuntsche & Silbereisen, 2004; Vakalahi, 2001). However, adequately specifying the intergenerational links between substance use and abuse by mothers and children remains difficult (Hemphill et al., 2011; Koning et al., 2010). This study addresses some key gaps in the literature by including several possible family factors, multiple forms of adolescent substance use, and both mothers' and children's reports. Our key findings are that, after controlling for other individual and family factors, mothers' current drinking problems predicted adolescent drinking. In addition, mothers'

[2]National estimates from 2003 documented that 94% of UK youth aged 15–16 had consumed alcohol, 58% had smoked cigarettes, and 38% had used marijuana or hashish. Substance use initiation often occurred early in life: At age 13 (or younger) 61% of UK youth had already consumed at least one glass of beer, 65% had consumed at least one glass of wine, 41% had used cigarettes at least once, and 13% had used marijuana or hashish (Hibell et al., 2004).

current marijuana use approached significance predicting adolescent marijuana use. These findings are in line with other research highlighting linkages between maternal and child substance use (e.g. Dooley & Prause, 2007; Macleod et al., 2008).

It is notable that maternal substance use remained among the strongest predictors of adolescent substance use even after controlling for other family and child effects. Prior theory and research suggest that mothers may shape adolescent substance use in various ways. Mothers may model substance use for their children and they may shape youths' access to substances (e.g., by having their preferred substances accessible at home). Mothers may also influence social norms and perceptions of the risks and benefits of early substance use. Furthermore, problematic maternal substance use may increase adolescent substance use by interfering with successful parenting strategies such as adolescent monitoring. It is also possible that the associations documented in the current study result not from environmental factors but from genetic similarity between mother and child (Rowe, 1994). The current study does not test these mediating pathways, and thus cannot identify which may be responsible for the intergenerational transmission of substance use. However, regardless of the underlying pathways, the results of the current study suggest that policies and interventions should aim to identify youth whose mothers are problematic substance users. These youth are particularly at risk for substance use during early adolescence and thus early intervention among this population may be especially important.

This national sample of mothers born in 1970 brings important strengths to the understanding of family and child influences on adolescent substance use. Large national data sets offer confidence in terms of population coverage and generalizability. However, the sampling frame included the mothers when they themselves were children, so the sample is potentially biased due to any selective attrition. The relatively small sample size also leads to a lack of power to detect statistical significance for some findings. In addition, the sample is restricted to mother-adolescent dyads in which the children were born when mothers were aged 19 to 22 (in 1989 to 1992); therefore, it is unclear whether the results would generalize to mothers who were older when their children were born. Of course, this age limitation also is advantageous because it reduces the age heterogeneity that typically arises for the second generation when the first generation is the sampling target. Strengths of the study include that having both maternal and child reports helps overcome limitations of sole-source data. Future research, building on our findings and using a larger sample, should test mediational models specifying family mechanisms that connect maternal and adolescent substance use and abuse, as well as the family moderators of this link.

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Table 1

Descriptive Statistics for British Cohort Study Mothers (Age 34) and their Adolescent Children (Age 12–15) (n=276)

	% or *M (SD)*
Adolescent Characteristics	
Male Gender	52.2%
Older Age (14–15 years)	44.6%
Conduct Problems	2.00 (2.05)
Ever Drank Alcohol	76.4%
Sometimes Drank Alcohol	30.8%
Ever Smoked Cigarettes	34.4%
Ever Used Marijuana	10.2%
Family Characteristics	
Social Class - Non-Manual	49.3%
Social Class - Manual	33.7%
Social Class – Non-Employment	29.7%
Two-parent Family	72.5%
Parent-Adolescent Conflict	9.21 (6.88)
Mother Characteristics	
Mothers' Current Drinking Frequency	4.3% Never
	7.2% Never nowadays
	23.2% Less often or only on special occasions
	15.9% 2–3 times/month
	19.2% Once a week
	21.4% 2–3 days/week
	8.7% Most days
If drinks, units of alcohol in prior week	6.31 (9.12)
Mothers' Drinking Problems	20.6%[a]
Mothers' Smoking Frequency	29.0% Never
	21.4% Used to smoke, but not at all now
	7.2% Occasionally, but not every day
	42.4% Every day
If smokes, number of cigarettes per day	15.75 (7.30)
Mother Current Marijuana Use Frequency	82.5% Never tried
	5.5% Never nowadays
	7.3% Less often or only on special occasions
	0.7% Once a month
	0.7% Two to three times a month
	0.7% Two to three days a week
	2.6% On most days

Note:

[a]There were 14 missing cases for the Mothers' CAGE score.

Table 2

Logistic Regressions Predicting Adolescent Substance Use by Adolescent, Family, and Mother Characteristics

	Ever Drank Alcohol *N* = 262	**Sometimes Drank Alcohol *N*=262**	**Ever Smoked Cigarettes *N*=276**	**Ever Used Marijuana *N*=273**
	OR [CI]	**OR [CI]**	**OR [CI]**	**OR [CI]**
Intercept	1.05	0.11***	0.13***	0.00***
Mother Characteristics				
Mothers' Drinking Problems	2.50 [1.01 6.16]*	2.11 [1.05, 4.26]*	---	---
Mothers' Smoking Frequency	---	---	1.10 [0.87, 1.39]	---
Mothers' Frequency of Marijuana Use	---	---	---	1.32 [0.99, 1.76]+
Adolescent Characteristics				
Male Gender	0.73 [0.38, 1.41]	1.01 [0.56, 1.84]	0.43 [0.24, 0.78]**	1.92 [0.75, 4.93]
Older Age (14–15 years)	5.34 [2.51, 11.38]***	6.38 [3.49, 11.66]***	5.52 [3.08, 9.87]***	43.72 [5.61, 340.48]***
Conduct Problems	1.20 [0.92, 1.55]+	1.05 [0.86, 1.29]	1.21 [0.99, 1.47]+	1.20 [0.93, 1.54]+
Family Characteristics				
Social Class [Non-Manual[a] = Reference Group]				
Manual Social Class (Unskilled/Partly Skilled)	0.73 [0.38, 1.41]	0.76 [0.40, 1.43]	0.84 [0.45, 1.57]	1.25 [0.49, 3.17]
Non-Employment	0.97 [0.49, 1.94]	1.05 [0.55, 2.00]	1.08 [0.57, 2.02]	1.04 [0.39, 2.80]
Two-parent Family	1.83 [0.91, 3.68]+	0.96 [0.50, 1.84]	1.15 [0.61, 2.20]	1.01 [0.37, 2.75]
Parent-Adolescent Conflict	1.01 [0.94, 1.08]	1.03 [0.97, 1.09]	1.04 [0.98, 1.10]	1.04 [0.95, 1.13]

[a] One or Both Professional/ Managerial/Technical/ Skilled Non-manual.

+ p < .10 (one-tailed test, p < .05),

* *p* < .05,

** *p* < .01,

*** *p* < .001.

OR = Odds ratios. CI = 95% Confidence intervals.