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Associations of Father's Lifetime Cannabis Use Disorder with Child's Initiation of Cannabis Use, Alcohol Use, and Sexual Intercourse by Child Gender

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Abstract

Background: Early initiation of alcohol use, cannabis use, and sexual intercourse among adolescents is an important public health concern in the United States. Parents' history of substance use disorder is an important contributing factor for children's problem behaviors.

Objectives: The associations of fathers' lifetime cannabis use disorder with children's initiation of cannabis use, alcohol use, and sexual intercourse were examined. In addition, child's gender was considered as a moderator of each association.

Methods: Data from two companion longitudinal studies was utilized, the Rochester Youth Developmental Study and its intergenerational extension, the Rochester Intergenerational Study. Multiple linear regression analyses were conducted to examine the associations of the father's lifetime cannabis use disorder with the child's initiation of cannabis use, alcohol use, and sexual intercourse. To test gender differences in the associations, the study sample was stratified by child's gender.

Results: The average age of first cannabis use ($b=-3.71$, $p<.05$), alcohol use ($b=-3.65$, $p<.05$), and sexual intercourse ($b=-2.94$, $p<.05$) among daughters of fathers with a lifetime cannabis use disorder was lower than that of their counterparts after adjusting for all other control variables, whereas no significant differences were detected in a father-son relationship.

Conclusions: Homotypic continuity of cannabis use, as well as heterotypic continuity from the father's cannabis use to the child's alcohol use and sexual intercourse existed in a father-daughter relationship. These findings suggest that family-based interventions for female adolescents whose father has suffered from a cannabis use disorder be developed to prevent better adolescents' early substance use and sexual intercourse.

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Conflict of interest:

Author does not have any conflict of interest to report.

Declaration of Interest

The author reports no conflicts of interest.

Keywords

cannabis use disorder; adolescent cannabis use; adolescent alcohol use; adolescent sexual intercourse; intergenerational continuity; sex differences

Introduction

Engaging in healthy behaviors during early adolescence is vital for promoting adolescents' long-term health (Sawyer et al., 2012). However, adolescents in the United States (U.S.) commonly experience various problem behaviors that can interrupt prosocial and healthy developments, such as substance use and sexual intercourse; 32.8% of 9–12th grade students were current alcohol users, 21.7% were current cannabis users, and 41.2% had sexual intercourse in 2015 (Kann et al., 2016). Since early onset of these health risk behaviors during adolescence is linked to adverse consequences, including mental health problems, antisocial behaviors, academic failure, and substance abuse in later life (Jordan, & Andersen, 2017; Trenz et al., 2012; DeWit, Adlaf, Offord, & Ogborne, 2000; Hingson, Heeren, & Winter, 2006; Moss, Chen, & Yi, 2014; Sandfort, Orr, Hirsch, & Santelli, 2008; Longmore, Manning, Giordano, & Rudolph, 2004), delaying the onset of these behaviors is a critical public health challenge (Cuffee, Hallfors, & Waller, 2007). Thus, identification of the risk factors for earlier debut of problem behaviors among adolescents is prerequisite to the identification of prevention and intervention targets.

Previous studies have documented various influencing factors for adolescent substance use and sexual behavior. Demographic characteristics are associated with adolescents' problem behaviors. In the U.S., Hispanics show higher prevalence of early alcohol and cannabis use and non-Hispanic Blacks show higher prevalence of early sexual intercourse compared with other race/ethnicities (Kann et al., 2016). Neighborhood characteristics are another significant factor associated with adolescents' health risk behaviors. For example, neighborhood crime rate is positively associated with adolescent alcohol use (Yabiku, Rayle, Okamoto, Marsiglia, & Kulis, 2007) and cannabis use (Reboussin, Milam, Green, Ialongo, & Furr-Holden, 2016). In addition, parental and peer substance use are positively related to adolescent substance use (Eiden et al., 2016).

Numerous researchers have identified parental substance abuse as a key risk factor for adolescents' problem behaviors (Knight, Menard, & Simmons, 2014; Henry, 2017; Kosty et al., 2015; Hopfer, Stallings, Hewitt, & Crowley, 2003; Marmorstein, Iacono, & McGue, 2009; De Genna, Goldschmidt, & Cornelius, 2015). Parents' problematic use of one substance can be transferred to offspring's use of the same substance (homotypic continuity) and other problem behaviors (heterotypic continuity) (Nadel, & Thornberry, 2017). Specifically, cannabis is the most commonly used illicit drug in the U.S. (Hasin et al., 2015) and despite its growing acceptance, there is evidence that cannabis abuse can have negative health consequences (Bolla, Brown, Eldreth, Tate, & Cadet, 2002). Studies reported that children of parents with problematic cannabis use are more likely to abuse cannabis (Kosty et al., 2015; Hopfer et al., 2003), be alcohol dependent (Marmorstein et al., 2009), and initiate sexual intercourse early (De Genna et al., 2015) as compared to their counterparts.

Children model parents' behaviors through frequent direct observations and parents' perception of the behaviors as social norms (White, Johnson, & Buyske, 2000; Ellis, Zucker, & Fitzgerald, 1997), so parents' problem behaviors are likely to be associated with early initiation of problem behaviors for their children.

In intergenerational continuity of substance use and other problem behaviors, parents' gender has been identified as an important factor (Nadel, & Thornberry, 2017; Henry, & Augustyn, 2017; Capaldi, Tiberio, Kerr, & Pears, 2016). However, much of our knowledge about the influence of parents on children is focused on mothers (Nadel, & Thornberry, 2017; Phares, Fields, Kamboukos, & Lopez, 2005). In several studies, mother's alcohol and cannabis use has been positively associated with the child's problem behaviors including alcohol use, cannabis use, and early sexual behavior (Capaldi et al., 2016; Kosty et al., 2015; De Genna et al., 2015). More work to understand the father's influences is needed (Nadel, & Thornberry, 2017; Phares et al., 2005). Considering men have higher prevalence of cannabis use disorder in the U.S. (Hasin et al., 2015), the role of father's problematic cannabis use in the intergenerational continuity should be clearly recognized.

In general, male and female adolescents have different patterns of problem behaviors (Kann et al., 2016). Boys have higher prevalence of alcohol and cannabis use (Kloos, Weller, Chan, & Weller, 2009), as well as experience sexual intercourse earlier (Cuffee et al., 2007) than girls. However, to date, no clear evidence has been obtained regarding children's gender differences in the homotypic and heterotypic continuity, specifically from the father's cannabis use disorder. A clear understanding for the intergenerational continuity from fathers' cannabis use to children's problem behaviors and its gender differences can be helpful to identify adolescent populations at a higher risk of problem behaviors.

The focus of the current study was to twofold. First, this study examined associations of fathers' lifetime cannabis use disorder with children's age of initiation of cannabis use, alcohol use, and sexual intercourse. Second, this study examined that extent to which the association of fathers' lifetime cannabis use disorder on children's age of initiation of problem behaviors differs for male as compared to female children. The following research questions were examined in this study: What are the associations between a father's lifetime cannabis use disorder and his child's initiation of problem behaviors including cannabis and alcohol use, as well as sexual intercourse? Do differences exist in the associations between father-son and father-daughter relationships?

Methods

Data Source

This study used data from two companion longitudinal studies, the Rochester Youth Developmental Study (RYDS) and its intergenerational extension, the Rochester Intergenerational Study (RIGS). The RYDS was conducted from 1988 to 2006 to assess adolescents' problem behaviors including substance abuse and delinquency. At the beginning, 1,000 adolescents (referred to as Generation 2 [G2], males: 73%, females: 27%) who were representative of the 7–8th grade students at public schools in Rochester, NY and their primary caregiver (G1), were recruited to participate in the study. Boys and adolescents

living in high crime neighborhoods were oversampled. The RIGS began in 1999 to assess intergenerational continuity in substance use and other problem behaviors. The first-born child of G2 (G3) and the child's other caregiver (OCG) were invited to take part in the study. Annual interviews of G2, OCG, and G3 have been conducted since the inception of RIGS. The RIGS is currently in its 19th year. Procedures of data collection and use were reviewed and approved by the Institutional Review Board at the University at Albany (Thornberry, 2016).

This study used the data of 531 G2-G3 dyads in the RIGS. G2 participants who did not measure the lifetime cannabis use disorder (n=40) and/or alcohol use disorder (n=39) were excluded. Next, G2 participants who have no information for age at start of study (n=22) were excluded. In addition, of the remaining 467 G2-G3 dyads (302 father-child and 165 mother-child), mother-child dyads were excluded since this study focused on the influences of fathers' cannabis use on the child's problem behaviors and the prevalence of lifetime cannabis use disorder among G2 mothers is too low (only two mothers met the cannabis use disorder criteria). Finally, G3 participants who have missing values for the three problem behaviors (n=111) were excluded. This included those who did not initiate cannabis use, alcohol use, and sexual intercourse prior to their last observed interview. As a result, 191 father-child dyads were considered in this study.

Dependent Variables

Dependent variables included the child's age of first cannabis use, alcohol use, and sexual intercourse. These three problem behaviors were measured as continuous variables from self-reported responses in the annual RIGS interviews. Children responded with their previous experience of cannabis (marijuana, reefer, or weed) use, alcohol (beer, wine, or hard liquor) use without parents' permission, and sexual intercourse at their first interview (interviews began at age 8 for G3). If the child had previous experiences, they additionally responded at what age they experienced first using cannabis and alcohol or having sexual intercourse. Information of children who did not have previous experiences of those three problem behaviors at the age 8 interview was collected from the prospective annual interviews, thus creating an age of first use of substances and first sexual intercourse for each G3 respondent who initiated at some point during the observation period.

Independent Variables

The father's lifetime cannabis use disorder was measured as a dichotomous variable using the Computerized Diagnostic Interview Schedule (CDIS)-Version IV (Robins et al., 2000) from the RYDS interviews. The CDIS-IV was administered to RYDS participants from April 2004 to July 2007 when their age was in late 20s or early 30s. The fathers who met the criteria for lifetime cannabis abuse or dependence were considered to have a lifetime cannabis use disorder. Cannabis abuse was defined as a maladaptive pattern of use, leading to clinically significant impairment or distress, as manifested by one or more of the abusive symptoms within a 12-month period. Cannabis dependence was defined as a maladaptive pattern of use, leading to clinically significant impairment or distress, as manifested by three or more of the dependence symptoms in the same month period.

A set of variables that were used in previous studies about intergenerational continuity of substance use (Henry, 2017; Nadel, & Thornberry, 2017) were included in the analyses as control variables. These included race/ethnicity (African American or not / Hispanic or not), father's age at start of the study (year), father's age at child's birth (year), neighborhood arrest rate (per 100 people), and father's lifetime alcohol use disorder which was measured as a dichotomous variable using the same criteria for lifetime cannabis use disorder in the CDIS-IV. The arrest rate of the father's neighborhood at the start of RYDS was used as a sampling parameter.

Statistical Analysis

Group differences between race/ethnicity, father's cannabis use disorder, and father's alcohol use disorder categories in the child's average age of first cannabis use, alcohol use, and sexual intercourse were tested with Mann-Whitney U tests due to heterogeneity of variance and unbalanced sample size between groups. The number of observations in some levels of the independent variables was insufficient. Pearson correlation coefficients between continuous independent variables and each dependent variable were calculated. Multiple linear regression analyses were conducted to examine the associations of the father's lifetime cannabis use disorder with the child's initiation of cannabis use, alcohol use, and sexual intercourse. Data of children who experienced each problem behavior during the study period was analyzed in each regression model. To test differences in the associations between father-son and father-daughter relationships, stratified regression analyses by child's gender were conducted. All statistical analyses were conducted using SAS, version 9.4.

Results

Data of the 191 father-child dyads from the RYDS and the RIGS were used. Seventy point seven percent were African Americans and 17.3% were Hispanics. Overall, 6.8% of fathers had a lifetime cannabis use disorder and 20.4% had a lifetime alcohol use disorder. The children's average age of first cannabis use was 16.8 (Standard Deviation [SD]=3.1), alcohol use was 17.1 (SD=3.2), and sexual intercourse was 16.0 (SD=2.3). Descriptive statistics of the study sample is shown in Table 1.

Evidence of gender differences was found from group difference tests. The average age of first cannabis use, alcohol use, and sexual intercourse among daughters of fathers with a lifetime cannabis use disorder was lower than that of their counterparts ($p<.05$), whereas no significant differences were detected among sons. The average age of first cannabis use among daughters of fathers with a lifetime cannabis use disorder was 14.6 (SD=2.1), while that of their counterparts was 17.2 (SD=2.8). The average age of first alcohol use among daughters of fathers with a lifetime cannabis use disorder was 14.4 (SD=2.3), while that of their counterparts was 17.2 (SD=2.9). The average age of first sexual intercourse among daughters of fathers with a lifetime cannabis use disorder was 14.2 (SD=2.7), while that of their counterparts was 16.6 (SD=2.8). Group differences by race/ethnicity, the father's alcohol use disorder, and the father's cannabis use disorder in the average age of the child's first cannabis use, alcohol use, and sexual intercourse are available in Table 2.

As shown in Table 3, in combined regression models, the association between the father's lifetime cannabis use disorder and the child's age of first cannabis use was insignificant. The average age of first alcohol use among children of fathers with a lifetime cannabis use disorder was 2.57 years lower compared to their counterparts ($p<.05$). The average age of first sexual intercourse among children of fathers with a lifetime cannabis use disorder was 1.54 years lower compared to their counterparts ($p<.05$). To test for effect modification by the child's gender on associations of the father's lifetime cannabis use disorder and the child's initiation of cannabis use, alcohol use, and sexual intercourse, an interaction term between the father's lifetime cannabis use disorder (yes or no) and the child's gender (son or daughter) was included in combined regression models. Although interactions for the child's alcohol use and cannabis use were statistically insignificant, the interaction for the child's sexual intercourse was significant ($p=.03$).

Based on group difference tests and effect modification analyses, final regression models were stratified by child's gender to show gender differences in the associations of interest. Table 4 presents results of the stratified regression analyses. The father's lifetime cannabis use disorder was significantly associated with only the daughter's age of initiation of cannabis use, alcohol use, and sexual intercourse after adjusting for all other control variables. The average age of first cannabis use among daughters of fathers with a lifetime cannabis use disorder was 3.71 years lower compared to daughters of fathers who did not have a lifetime cannabis use disorder ($p<.05$). The average age of first alcohol use among daughters of fathers with a lifetime cannabis use disorder was 3.65 years lower compared to their counterparts ($p<.05$). The average age of first sexual intercourse among daughters of fathers with a lifetime cannabis use disorder was 2.94 years lower compared to their counterparts ($p<.05$). No significant associations between the father's lifetime cannabis use disorder and the son's initiation of cannabis use, alcohol use, and sexual intercourse were detected.

The average age of first sexual intercourse among African American sons was 1.77 years lower compared to other race/ethnicity ($p<.05$). No other significant results were found regarding race/ethnicity. The father's age at child's birth was negatively associated with the daughter's age of first cannabis use ($b=-.55$, $p<.01$), alcohol use ($b=-.54$, $p<.01$), and sexual intercourse ($b=-.26$, $p<.05$), whereas no significant associations were detected in a father-son relationship. No significant results regarding neighborhood arrest rate and the father's alcohol use disorder were detected.

Discussion

This study examined the influences of the father's lifetime cannabis use disorder on the child's initiation of cannabis use, alcohol use, and sexual intercourse. Specifically, this study tested differences in the associations between father-son and father-daughter dyads. To my knowledge, this study is the first investigation into children's gender differences in the homotypic and heterotypic intergenerational continuity of problem behaviors influenced by fathers' cannabis use using prospective longitudinal data.

In this study, the father's lifetime cannabis use disorder was significantly associated with only the daughter's age of initiation of cannabis use, alcohol use, and sexual intercourse. Several previous studies have identified an effect of parental substance use on the uptake of substance use and other problem behaviors among children (Capaldi et al., 2016; De Genna et al., 2015; Kosty et al., 2015; Hopfer et al., 2003; Marmorstein et al., 2009; Knight et al., 2014). However, regarding differences of child's gender in the effect of father's cannabis use disorder, no clear evidence was previously found.

Several researchers have posited that gender concordance between parents and offspring could be an important aspect of substance use transmission, indicating that intergenerational continuity in substance use by parental modeling of behaviors may be more prominent among same-sex parent-child dyads (Shanahan, McHale, Osgood, & Crouter, 2007; Andrews, Hops, & Duncan, 1997; Andrews, Hops, Ary, Tildesley, & Harris, 1993). However, in the study conducted by Kosty and colleagues, continuity in cannabis use disorder was significant in only female parent-child (mother-daughter) dyads, whereas no significant continuity was found among male parent-child (father-son) dyads (Kosty et al., 2015). In addition, in the current study, the continuity was significant in only father-daughter dyads, whereas no significant associations were detected in father-son dyads. Considering the Kosty investigation and the current study together, one might speculate that the intergenerational influences are stronger for female children, regardless of parents' gender, though more work is needed to test this hypothesis directly. In general, male adolescents appear to be influenced less by their parents and more heavily influenced by their peers compared to female adolescents (Cutrín, Gómez-Fraguela, & Sobral, 2017; Trudeau, Mason, Randall, Spoth, & Ralston, 2012; Javdani, Sadeh, & Verona, 2011; Bennett, Farrington, & Huesmann, 2005; Ehrensaft, 2005). If the strong intergenerational influence on females holds in future replications, it would suggest the need to provide intervention initiatives for female adolescents whose father or mother have suffered from a cannabis use disorder.

In the Rochester studies, the majority of G2 parents are males (73%) because of the oversampling of boys in the initial study. Moreover, the prevalence of mother participants' lifetime cannabis use disorder was too low (only three mothers met the cannabis use disorder criteria in the original RIGS) to allow for investigation; therefore, child's gender differences in mother-child relationships could not be examined. Further studies using data of sufficient sample size comparing the continuity in cannabis use among opposite-sex and same-sex parent-child dyads altogether are needed to provide more conclusive evidence. Specifically, the influences of mothers' cannabis use on sons' initiation of substance use and sexual intercourse should be examined.

Another notable finding regarding continuity of cannabis use was found in this study. Not only homotypic continuity, but also significant heterotypic continuity existed. The father's history of cannabis use disorder was significantly associated with the daughter's initiation of alcohol use and sexual intercourse. These results were consistent with previous studies, even though they did not present children's gender differences. Parental cannabis dependence was associated with children's alcohol dependence (Marmorstein et al., 2009). In addition, the mother's chronic cannabis use was significantly associated with early onset of sexual intercourse and other problem behaviors of the children (De Genna et al., 2015). Findings of

the current study may suggest that female adolescents of fathers with a lifetime cannabis use disorder should also be targeted in prevention programs for other problem behaviors, specifically early initiation of alcohol use and sexual intercourse.

A family-based intervention that considers the father's cannabis use disorder can be useful to prevent early onset of the three problem behaviors in early adolescence. In addition, experiences of substance use and sexual intercourse in earlier adolescence can increase the likelihood of substance abuse and unsafe sexual behavior in later adolescence and adulthood (Jordan, & Andersen, 2017; Sandfort et al., 2008). Thus, this may also be a supportive strategy to reduce the prevalence in later adolescence and adulthood by preventing early onset of cannabis and alcohol use, as well as sexual intercourse in early adolescence.

This study has some important limitations that should be considered. First, the number of observations in some levels of independent variables, including father's cannabis use disorder, was insufficient, so these estimates should be interpreted with caution since they are considered statistically unreliable. It will be important for other studies to attempt to replicate these findings with a larger sample size. Some fathers who did not participate in the diagnostic interview for the lifetime cannabis use disorder due to unknown reasons were excluded. Children who did not initiate the behavior during the observation period were excluded. The exclusion could result in bias. In addition, information about the time point when the father experienced the cannabis use disorder symptoms was not considered, although it might affect the study results. This study could not eliminate residuals and unmeasured confounding, but this is typically the case in observational studies. Lastly, data was collected from residents in the city of Rochester, NY, and the majority of them were African Americans and Hispanics, so study findings are subject to generalizability issue.

Despite the limitations, this study adds novel findings to the literature regarding children's gender differences in the intergenerational continuity of cannabis use and other problem behaviors. Homotypic continuity of cannabis use, as well as heterotypic continuity from the father's cannabis use to his child's initiation of alcohol use and sexual intercourse existed in only a father-daughter relationship, whereas no significant associations were detected in a father-son relationship. These findings suggest that family-based interventions for female adolescents whose father has suffered from a cannabis use disorder be developed to prevent better adolescents' early substance use and sexual intercourse.

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Table 1.

Descriptive statistics of study sample

Variable	Total (n=191)		Son (n=96)		Daughter (n=95)	
	n	%/M(SD)	n	%/M(SD)	n	%/M(SD)
African American						
No	56	29.3	27	28.1	29	30.5
Yes	135	70.7	69	71.9	66	69.5
Hispanic						
No	158	82.7	78	81.2	80	84.2
Yes	33	17.3	18	18.8	15	15.8
Father's age at start of study						
Year	191	14.1 (0.8)	96	14.1 (0.8)	95	14.1 (0.7)
Father's age at child's birth						
Year	191	20.3 (2.4)	96	20.1 (2.4)	95	20.5 (2.3)
Neighborhood arrest rate						
Per 100 people	191	4.2 (1.9)	96	4.4 (1.8)	95	4.0 (1.9)
Father's lifetime alcohol use disorder						
No	152	79.6	77	80.2	75	78.9
Yes	39	20.4	19	19.8	20	21.1
Father's lifetime cannabis use disorder						
No	178	93.2	88	91.7	90	94.7
Yes	13	6.8	8	8.3	5	5.3
Child's age of first cannabis use						
Year	108	16.8 (3.1)	58	16.7 (3.3)	50	16.9 (2.8)
Child's age of first alcohol use						
Year	151	17.1 (3.2)	75	17.1 (3.5)	76	17.0 (2.9)
Child's age of first sexual intercourse						
Year	183	16.0 (2.3)	93	15.5 (2.1)	90	16.5 (2.4)

Note. M=mean. SD=standard deviation.

Table 2.

Results of Mann-Whitney U tests and Pearson correlations

Independent variable	Age of first cannabis use				Age of first alcohol use				Age of first sexual intercourse			
	n	M (SD)/r	p	n	M (SD)/r	p	n	M (SD)/r	p	n	M (SD)/r	p
Overall	58	16.7 (3.3)		50	16.9 (2.8)		75	17.1 (3.5)		93	15.5 (2.1)	
African American												
No	18	16.9 (3.2)	0.70	18	17.0 (2.7)	0.88	22	16.6 (4.0)	0.35	25	17.0 (2.1)	0.82
Yes	40	16.6 (3.4)		32	16.9 (2.9)		53	17.4 (3.3)		51	17.1 (3.3)	
Hispanic												
No	46	16.7 (3.2)	0.78	40	16.7 (2.8)	0.41	60	17.0 (3.5)	0.42	63	17.0 (3.1)	0.59
Yes	12	16.7 (3.7)		10	17.8 (3.0)		15	17.9 (3.7)		13	17.5 (1.5)	
Father's age at start of study												
Year	58	0.19	0.16	50	0.35	<0.05	75	0.07	0.56	76	0.17	0.13
Father's age at child's birth												
Year	58	-0.12	0.36	50	-0.36	<0.01	75	-0.20	0.09	76	-0.36	<0.01
Neighborhood arrest rate												
Per 100 people	58	-0.06	0.65	50	0.01	0.92	75	0.06	0.60	76	0.02	0.86
Father's lifetime alcohol use disorder												
No	47	16.7 (3.5)	0.48	39	16.8 (2.5)	0.92	59	17.4 (3.5)	0.26	57	16.9 (3.0)	0.46
Yes	11	16.5 (2.3)		11	17.3 (3.8)		16	16.4 (3.7)		19	17.4 (2.6)	
Father's lifetime cannabis use disorder												
No	53	16.6 (3.4)	0.99	45	17.2 (2.8)	<0.05	70	17.3 (3.4)	0.25	71	17.2 (2.9)	<0.05
Yes	5	17.0 (2.7)		5	14.6 (2.1)		5	14.8 (5.1)		5	14.4 (2.3)	

Note. M=mean. SD=standard deviation. r=Pearson correlation coefficient. Group differences between two-level category variables and dependent variables were tested by Mann-Whitney U tests. **Bolded** mean differences and correlation coefficients are statistically significant.

Table 3.

Results of multiple regression analyses with interaction

Independent variable	Child's age of first cannabis use (n=108)		Child's age of first alcohol use (n=151)		Child's age of first sexual intercourse (n=183)	
	Model A-1 b (SE)	Model A-2 b (SE)	Model B-1 b (SE)	Model B-2 b (SE)	Model C-1 b (SE)	Model C-2 b (SE)
African American						
Yes (vs. No)	-0.46 (0.99)	-0.51 (0.99)	0.93 (0.90)	0.93 (0.90)	-1.01 (0.61)	-1.10 (0.61)
Hispanic						
Yes (vs. No)	-0.09 (1.15)	-0.13 (1.14)	1.24 (1.06)	1.24 (1.07)	-0.35 (0.70)	-0.44 (0.70)
Father's age at start of study						
Year	1.11** (0.36)	1.05** (0.36)	0.50 (0.34)	0.50 (0.34)	0.19 (0.22)	0.15 (0.22)
Father's age at child's birth						
Year	-0.34** (0.12)	-0.34** (0.12)	-0.36** (0.12)	-0.36** (0.12)	-0.09 (0.08)	-0.10 (0.08)
Neighborhood arrest rate						
Per 100 people	-0.16 (0.17)	-0.17 (0.17)	-0.13 (0.15)	-0.13 (0.15)	0.03 (0.10)	0.03 (0.10)
Father's alcohol use disorder						
Yes (vs. No)	0.70 (0.88)	0.78 (0.88)	0.69 (0.68)	0.69 (0.68)	0.49 (0.49)	0.52 (0.49)
Father's cannabis use disorder						
Yes (vs. No)	-1.58 (1.20)	-2.99 (1.60)	-2.57* (1.14)	-2.59 (1.57)	-1.54* (0.76)	-3.32** (1.12)
Child's gender						
Son (vs. Daughter)	-0.26 (0.57)	-0.49 (0.60)	0.01 (0.51)	0.01 (0.53)	-0.89** (0.34)	-1.07** (0.34)
Interaction term						
Father's cannabis use disorder × Child's gender		2.60 (1.98)		0.04 (2.05)		2.83* (1.32)

Note.

*
 $p < .05$ **
 $p < .01$ b =regression coefficient. SE=standard error. All the regression models above are adjusted for all the variables shown in the table.

Results of stratified regression analyses by child’s gender estimating associations of father’s lifetime cannabis use disorder with child’s age of first alcohol use, cannabis use, and sexual intercourse

Table 4.

Independent variable	Child’s age of first cannabis use		Child’s age of first alcohol use		Child’s age of first sexual intercourse	
	Son (n=58)	Daughter (n=50)	Son (n=75)	Daughter (n=76)	Son (n=93)	Daughter (n=90)
	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)
African American						
Yes (vs. No)	−0.80 (1.74)	−1.14 (1.10)	3.11 (1.61)	−0.62 (1.01)	−1.77* (0.87)	−0.57 (0.84)
Hispanic						
Yes (vs. No)	−0.68 (2.03)	−0.63 (1.28)	3.58 (1.87)	−0.63 (1.23)	−0.28 (0.98)	−0.90 (1.01)
Father’s age at start of study						
Year	0.78 (0.56)	1.49** (0.47)	0.34 (0.53)	0.63 (0.44)	0.08 (0.27)	0.28 (0.36)
Father’s age at child’s birth						
Year	−0.20 (0.18)	− 0.55** (0.15)	−0.21 (0.18)	− 0.54** (0.15)	0.06 (0.10)	− 0.26* (0.12)
Neighborhood arrest rate						
Per 100 people	−0.17 (0.29)	−0.05 (0.20)	−0.12 (0.25)	−0.11 (0.18)	0.17 (0.13)	−0.09 (0.14)
Father’s alcohol use disorder						
Yes (vs. No)	−0.27 (1.47)	1.58 (1.09)	0.41 (1.13)	1.25 (1.47)	0.78 (0.66)	0.44 (0.72)
Father’s cannabis use disorder						
Yes (vs. No)	0.25 (1.83)	− 3.71* (1.51)	−1.71 (1.77)	− 3.65* (1.47)	−1.05 (0.91)	− 2.94* (1.27)

Note.

* $p<.05$

** $p<.01$.

b=regression coefficient, SE=standard error. All the regression models above are adjusted for all the variables shown in the table.