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Psychosocial Correlates of Adolescent Marijuana Use: Variations by Status of Marijuana Use

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Abstract

Introduction—This study examined the associations between psychosocial factors and status of marijuana use: former experimentation, current occasional, and current frequent use.

Methods—Data were collected from a nationally-representative sample of U.S. tenth-graders who participated in the 2005/6 Health Behavior in School-aged Children Study (n=1,465). Multinomial regressions, run separately by gender, examined the association of risk and protective factors from the individual (life satisfaction; academic achievement; aggression, bullying) and contextual (mothers and fathers' knowledge of adolescents' activities, school climate) domains with status of marijuana use (former experimentation, current occasional use, current frequent use).

Results—Former experimental and current marijuana use were negatively associated with protective factors such as academic achievement, mothers' and fathers' knowledge of adolescents' activities, and life satisfaction, but not with positive school climate. Former experimental and current marijuana use were positively associated with aggression and bullying perpetration. Most associations varied by gender and status of marijuana use. In adjusted analyses, aggression emerged as the sole risk factor and fathers' knowledge as the sole protective factor that were positively associated with most statuses of marijuana use, across gender.

Conclusion—Fathers may be particularly important in preventing adolescent marijuana use, and interventions promoting fathers' knowledge of adolescents' activities are warranted.

Keywords

marijuana use; experimentation; psychosocial correlates; gender differences

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1. Introduction

Marijuana is the most widely used illicit drug among U.S. adolescents, with 14.2% of tenth-graders reporting past 30-day use in 2008 (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Adolescent marijuana use has been linked to adverse outcomes including elevated depression, conduct problems, and low education achievement (Fergusson, Horwood, & Beautrais, 2003; Hall, 2006; Wittchen et al., 2007), as well as increased risks for dependence compared to later initiation (Fergusson, Horwood, Lynskey, & Madden, 2003; Schneider, 2008). Yet few studies have examined status-specific psychosocial correlates of marijuana use for former experimental, current occasional and more frequent users.

Guided by problem behavior theory (Jessor, 1991), this study focused on individual and contextual correlates that either have been less extensively studied in relation to marijuana use, although their association with other substances has been established (parental knowledge of adolescents' activities, bullying, aggression), or because previous research documenting their association with different degrees of involvement with marijuana is inconclusive (life satisfaction, academic achievement, school climate).

Three hypotheses were examined. First, we hypothesized that former experimental, current occasional and current heavy marijuana use would be *negatively* associated with *protective factors* (life satisfaction, academic achievement, mothers' and fathers' knowledge of adolescents' activities, and positive school climate) and *positively* associated with *risk behaviors* (aggression and bullying). Second, we expected that the hypothesized associations would vary by status of marijuana use, as suggested by previous research (Monshouwer et al., 2006). Third, we anticipated gender differences in the hypothesized associations, given past findings of gender differences in the association of psychosocial correlates and marijuana use (Brook et al., 1998; Tu, Ratner, & Johnson, 2008).

2. Methods

2.1 Sample and Procedures

The US 2005/6 Health Behavior in School-Aged Children (HBSC) study is a survey of a nationally-representative, school-based sample conducted every four years. More information on methods and procedures can be found at www.hbsc.org (Currie et al., 2008a). A three-stage stratified clustered sampling, with classes as the sampling units, was used to select a nationally representative sample of students in grades 6-10. African-American and Hispanic students were oversampled. Data were collected through self-report questionnaires distributed in the classrooms and respondents' anonymity was ensured. The Institutional Review Board at the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development approved the survey.

Of all selected students, 85% (n=9,016) completed the questionnaire. Because of low prevalence of marijuana use among younger adolescents, we restricted the sample to tenth-graders (mean age=16) who had complete data on marijuana use and all predictors and covariates of interest. The final sample included 1,465 students.

2.2 Measures

Marijuana use was measured by combining respondents' answers to two questions, asking about marijuana use in their life and in the last 30 days. Response items ranged from "Never" to "40 times or more." Respondents who answered "Never" to lifetime and 30-day use were considered never users; those who reported using at least once in their lifetime but never in the past 30 days were considered former experimental users; respondents who reported using once or twice in the past 30 days were considered current occasional users;

respondents who reported using 3 or more times in the past 30 days were considered current frequent users.

Academic achievement—Respondents specified, on a 4-point scale (1=*below average*, 4=*very good*) what their teachers might think about their school performance compared to their classmates.

Life satisfaction was measured on a 10-point ladder (0=*worst possible life*; 10=*best possible life*).

Mothers' knowledge was the mean of five items ($\alpha=.77$). For each item, respondents reported, on a 4-point scale (1=*don't have/see mother*; 4=*knows a lot*) how much their mother/stepmother knows about their activities.

Fathers' knowledge was computed similarly to mothers' knowledge ($\alpha=.88$).

School climate was the average of three items. Respondents indicated how much they agreed/disagreed (1=*strongly agree*; 5=*strongly disagree*) with statements about the students in their class ($\alpha=.70$). Higher scores indicate a more negative school climate.

Aggression—The aggression scale was created by summing the answers to questions about physical fighting and weapon carrying. Respondents reported the frequency with which they carried a weapon during the last 30 days (response options: “I did not carry a weapon” to “6 or more days”). Respondents also indicated how often they had been involved in a physical fight in the past 12 months (response options: “I have not been in a physical fight,” to “4 times or more”). Higher scores indicate greater aggression.

Bullying—Involvement in bullying was measured by two questions asking the frequency with which respondents bullied others or were bullied in the past couple of months. Response items ranged from “I haven't been bullied/haven't bullied another student at school the past couple of months” to “several times a week.” Respondents were categorized as “victims” if they only reported bullying victimization (at least once or twice in the past couple of months); “perpetrators” if they only reported bullying perpetration; “victim-perpetrators” if they reported both bullying victimization and perpetration; and “not involved” if they reported neither.

Demographic characteristics included gender, race/ethnicity (White/Black/Hispanic/Other), family composition (one parent/two parents/other) and a family affluence scale (FAS), an indicator of adolescents' socioeconomic status constructed from questions about family wealth and categorized into tertiles (Currie et al., 2008b).

2.3 Analysis Strategy

All analyses were conducted using Stata 9 to adjust for the cluster-based sampling design of HBSC. Weights were applied to provide nationally representative estimates. Descriptive statistics were computed for all variables. Multinomial logistic regression models, separately for each predictor, then examined the association between each predictor and marijuana use, controlling for sociodemographics. Finally, multivariable models, separately by gender, regressed marijuana use jointly on all psychosocial factors, controlling for sociodemographics.

3. Results

3.1 Study Sample

The sample was approximately half boys and half girls. Most respondents were non-Hispanic Whites, lived in two-parent families, and were of medium socioeconomic status (Table 1). Almost two thirds of respondents had never used marijuana, 18% were former experimental users, 8% current occasional users and 8% current frequent users.

3.2 Results from Multivariate Analyses

Because the results from the predictor-specific models were similar to those of the final model, we only present the results of the final models. These models show that the odds of marijuana use increased with aggression among boys and girls, with the exception of boys' current occasional use (Table 2). A higher fathers' knowledge of adolescents' activities was associated with a lower odds of former experimental and current marijuana use for boys and girls, except for boys' experimental use. The associations of all other risk and protective correlates with marijuana use differed by gender and status of use. Mothers' knowledge of adolescents' activities was associated with lower odds of current frequent use (boys and girls), current occasional use (boys) and former experimental use (girls). Higher academic achievement was associated with lower odds of experimental and current frequent use only among boys. Conversely, better life satisfaction was negatively associated with current frequent use, only among girls. Bullying perpetration was associated with higher odds of experimental use, whereas being a bully victim-perpetrator was correlated with lower odds of current occasional use, for boys and girls. Worse perceptions of the school climate were associated with lower odds of experimental marijuana use, only among girls.

4. Discussion

Our analyses of a representative population-based sample of US tenth-graders indicate significant differences in psychosocial correlates of marijuana use by gender and status of use. Consistent with our first hypothesis, our results show that former experimental and current marijuana use were negatively associated with protective factors such as academic achievement, mothers' and fathers' knowledge of adolescents' activities and life satisfaction, but not with a positive school climate. Former experimental and current use were also positively associated with risk behaviors such as aggression and bullying. We further found support for our second and third hypotheses of differential associations by gender and type of involvement.

Aggression emerged as a psychosocial risk factor for all but one status of marijuana use across gender. These findings support previous research showing a positive association between aggressive behavior and marijuana initiation among boys (Korhonen et al., 2008) and girls (van den Bree et al., 2005). However, in contrast to findings from a US national sample (e.g., van den Bree et al., 2005), our study showed that aggression is also linked to marijuana experimentation for both genders. It is unclear how aggression and marijuana are associated. It seems most likely that they share common determinants or possibly the experience of one of these behaviors may contribute to the likelihood of occurrence of the other (Fergusson, Horwood, & Swain-Campbell, 2002). While these findings do not permit the conclusion of a cause-and-effect association, they do imply that aggression and marijuana use co-occur and that prevention programs targeted at one could affect the other.

Fathers' knowledge of adolescents' activities was significantly protective for all but one status of marijuana use for boys and girls. Compared to mothers' knowledge, surprisingly little is known on fathers' knowledge because studies examining the effect of parenting practices on substance use have either looked at the protective effect of mothers' knowledge

only or at that of a combined measure of parental knowledge. Fathers' knowledge of adolescents' activities is achieved through a variety of methods including adolescents' disclosure of information, observation or third-party (e.g., friends) reports of adolescents' activities, or by asking the mothers (Waizenhofer et al., 2004). Fathers' knowledge may influence adolescents' beliefs about marijuana use, which could, in turn, affect their intentions to use and, ultimately, their use (Lac et al., 2009). Further investigation of the mechanism of influence of fathers' knowledge should be the focus of future research, as this information could inform family-based prevention programs.

Other gender- and status-specific correlates of marijuana use included academic achievement, school climate, and bullying perpetration. Academic achievement emerged as the only boy-specific protective factor, confirming previous findings among a Swiss national sample (Stronski, Ireland, Michaud, Narring, & Resnick, 2000). Our results indicated that a negative school climate decreased girls' risk of marijuana experimentation, while bullying perpetration doubled their risk. Our findings differ from a previous study showing that school-related problems were associated with marijuana use across gender and stage of use (van den Bree et al., 2005). These differences may stem from the different measures used to assess school problems that could differentially affect boys' and girls' marijuana use. Bullying perpetration's association with girls' marijuana experimentation supports previous findings of the association of bullying perpetration with substance use (Carlyle et al., 2007; Bolognini et al., 2007). However, more research is needed to clarify why this association did not hold for girls' current use or for boys' use.

This study has many strengths, including the use of a large and nationally representative sample of US tenth-graders, the investigation of individual and contextual risk and protective correlates of marijuana use that had not been well documented in existing literature, and assessing commonalities and differences in these correlates by status of marijuana use.

However, some limitations should be considered, including the cross-sectional nature of the data that makes it difficult to test for the temporal sequence of these events and the study's reliance on adolescents' retrospective reports of marijuana use, rather than prospective measures.

This study has implications for the prevention of adolescent marijuana use. Our analyses indicate that aggression and, to a lesser extent and only among girls, bullying perpetration, are a source of concern because of their association with marijuana experimentation, current occasional and current frequent use. While aggressive behavior and bullying perpetration may not directly lead to marijuana use, these behaviors tend to co-occur and could reflect underlying risk factors associated with both behaviors (e.g., risk-taking personalities), as posited by problem behavior theory. Our findings suggest that intervention programs for problem behavior that address key determinants, such as parental knowledge, may prevent marijuana use and other problem behaviors among both boys and girls. Designing prevention programs that comprehensively address these multiple factors could prove cost-effective by reaching out to a wide population at risk for marijuana experimentation or current use.

Research Highlights

- Fathers' knowledge of adolescents' activities is protective against most statuses of marijuana use, across gender
- Association of aggression with marijuana use could reflect an underlying structure of risk behavior

- Most risk and protective factors against marijuana use vary by gender and status of use

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Table 1
Prevalence and means for the sample demographic characteristics and psychosocial correlates, by gender (n=1465)

Total (n=1465)							Boys (n=726)		Girls (n=739)				
	%	n	%	n	%	n		%	n	%	n		
Marijuana use													
Never use	63.40	904	60.33	427	66.34	477							
Former experimental use	18.59	295	18.98	148	18.21	147							
Current occasional use	7.85	106	7.88	52	7.82	54							
Current frequent use	10.17	160	12.81	99	7.63	61							
Bullying													
None	55.84	819	53.66	378	57.93	441							
Perpetrator	8.76	141	7.72	67	9.75	74							
Victim	24.09	350	26.45	198	21.82	152							
Victim-perpetrator	11.32	155	12.17	83	10.49	72							
Race/ethnicity													
White	46.98	752	48.95	378	45.09	374							
Black	18.29	287	17.05	138	19.48	149							
Hispanic	23.32	290	21.84	132	24.75	158							
Other	11.41	136	12.16	78	10.69	58							
FAS													
Low	27.68	400	26.27	189	29.04	211							
Medium	49.09	741	50.37	369	47.87	372							
High	23.22	324	23.36	168	23.09	156							
Family composition													
One parent	23.23	335	21.64	160	24.75	175							
Two parents	71.65	1050	73.41	522	69.96	528							
Other	5.12	80	4.95	44	5.29	36							
Total (n=1465)							Boys (n=726)					Girls (n=739)	
Mean		SE		Mean		SE		Mean		SE			

	Total (n=1465)		Boys (n=726)		Girls (n=739)	
	%	n	%	n	%	n
Aggression	2.92	0.07	3.24	0.09	2.61	0.08
Mothers' knowledge	17.37	0.10	17.17	0.13	17.56	0.14
Fathers' knowledge	14.49	0.20	14.79	0.31	14.19	0.21
School climate	2.47	0.04	2.43	0.05	2.51	0.05
Life satisfaction	7.32	0.07	7.39	0.09	7.25	0.10
Academic achievement	2.81	0.05	2.72	0.06	2.89	0.06

Table 2
Adjusted odds ratios estimates for the association of psychosocial correlates with marijuana use, by gender ^a

	Marijuana use ^b					
	Boys (n=726)			Girls (n=739)		
	Former experimental AOR (95%CI)	Current occasional AOR (95%CI)	Current frequent AOR (95%CI)	Former experimental AOR (95%CI)	Current occasional AOR (95%CI)	Current frequent AOR (95%CI)
Aggression	1.18 (1.01-1.37)	1.05(0.86-1.27)	1.45(1.19-1.76)	1.40(1.15-1.69)	1.44(1.12-1.87)	1.50(1.09-2.07)
Bullying						
No bullying	Referent	Referent	Referent	Referent	Referent	Referent
Victim	1.76 (0.61-5.09)	0.96(0.01-0.74)	0.93(0.19-4.55)	1.51(0.66-3.43)	0.07(0.01-0.58)	0.52(0.17-1.66)
Perpetrator	1.52(0.85-2.69)	2.10(0.82-5.38)	1.60(0.84-3.04)	2.30(1.23-4.31)	1.34(0.58-3.09)	1.53(0.64-3.64)
Victim - perpetrator	1.01(0.42-2.46)	2.39(0.52-10.96)	1.19(0.46-3.12)	1.13(0.38-3.33)	3.33(1.35-8.20)	0.61(0.12-3.15)
Life satisfaction	1.11(0.95-1.31)	1.08(0.88-1.33)	1.05(0.86-1.29)	0.90(0.75-1.08)	1.04(0.88-1.24)	0.80(0.66-0.98)
Academic achievement	0.61(0.47-0.78)	0.78(0.44-1.39)	0.59(0.43-0.81)	0.81(0.61-1.09)	0.79(0.56-1.12)	0.82(0.53-1.27)
Mothers' knowledge	0.94(0.85-1.03)	0.84(0.72-0.98)	0.77(0.67-0.87)	0.91(0.83-0.99)	0.91(0.81-1.01)	0.81(0.71-0.93)
Fathers' knowledge	0.93(0.86-1.00)	0.85(0.76-0.94)	0.86(0.78-0.95)	0.88(0.82-0.93)	0.93(0.86-0.99)	0.84(0.76-0.94)
School climate	1.08(0.76-1.54)	0.80(0.41-1.59)	1.29(0.82-2.04)	0.54(0.38-0.77)	1.19(0.77-1.84)	0.64(0.39-1.05)

^aModel controls for FAS, race/ethnicity and family composition

^bNo marijuana use is the reference category