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Sex Risk Behavior Six Months Post High School: Associations with College Attendance, Living With a Parent, and Prior Risk Behavior

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Abstract

Purpose—This study examined sex risk behavior among a community sample of youth in the fall after their senior year of high school. The primary goal was to examine associations between college and residential status and: (1) casual sex, (2) inconsistent condom use, and (3) high-risk sex.

Methods—Data were from 834 participants in the Raising Healthy Children project who were surveyed annually during high school and in the fall of the post-high school year.

Results—Thirty percent of participants reported inconsistent condom use, 23% reported casual sex, and 11% reported high-risk sex in the fall following high school. Youth in college were less likely than noncollege youth to report sex risk behavior. The protective association between college attendance and casual sex and intermittent condom use was fully explained by high school substance use, risky sex, and academic performance. The protective effect of college attendance on high-risk sex was partly explained by high school predictors. Living with parents at age 18 - 19 was not related to sex risk behavior.

Conclusions—Results from this study indicate that the higher prevalence of sex risk behavior among noncollege youth is largely a continuation of patterns of higher risk behavior and lower academic performance during high school. College attendance was protective for the most high-risk sex measure. Findings suggest that HIV and STI prevention efforts are needed among young adults who are not attending college and among high school students who earned poor grades, used drugs, or engaged in sexual risk behavior.

Keywords

Sexual risk behavior; emerging adulthood; college versus noncollege

The late teens and early twenties are a peak time of risk for acquiring HIV and other sexually transmitted infections (STIs). Adolescents and young adults are more likely than older adults to have multiple sex partners, engage in unprotected sexual intercourse, and select higher risk partners [1, 2]. The transition out of high school is characterized by

changes in romantic relationships, residence, parenthood, employment, and education [3]. Changes in residential and school status, especially, may provide increased opportunity for heavy episodic drinking, drug use, and risky sex in young adulthood [4]. Much of the existing research on correlates of risky sexual behavior in young adulthood focuses on college or high-risk populations, and little research has focused on community samples of young adults. To date, no longitudinal study has compared the sexual risk behavior (SRB) of young adults in college to those not in college and of those who continue to live with their parents to those who do not. In this study we examine these associations in a community sample of young adults. In addition, we consider whether these associations remain after adjusting for variables that may be associated with selection into college or residential status, as well as gender, ethnicity, childhood poverty, and relationship status.

Theories about the new freedoms, roles, and responsibilities associated with the transition to adulthood would suggest that the increased independence and self-governance that go along with college attendance and living away from home should result in increased risk behavior [4, 5]. Although no one has investigated the effects of college attendance on SRB, going to college has been linked repeatedly with increased heavy drinking [6]. Thus, it also is plausible that college attendance may be associated with increases in other risk behavior, including SRB.

Little research to date has explored the effects of normative changes in residential status (i.e., living with parents or not living with parents) on SRB in emerging adulthood. Parental monitoring during middle and early high school, however, is a robust predictor of adolescent SRB [7, 8]. The increased self-governance and consequent lessening of parental monitoring associated with living away from home also may be associated with increased sexual risk behavior. Again drawing a parallel to heavy drinking among college students, existing research strongly suggests that living away from parents may increase drinking [9, 10]. In fact, some research suggests that living away from parents is more predictive of young adult heavy drinking than is college attendance [4, 9, 10]. Similar results may be found in regard to SRB.

Alternatively, theory also suggests that individuals may carry on preexisting patterns of behavior in spite of these status changes. For example, the Social Development Model hypothesizes that elevated levels of substance use and other problem behaviors lead to selection into socialization experiences that value drug use and other problem behavior, including risky sex. These socialization experiences in turn lead to reinforcement of drug use and other problems, more bonding with those involved in these behaviors, beliefs favorable to problem behavior, and more problem outcomes [11]. Again drawing on the substance use literature, past research has not supported an association between college attendance and changes in marijuana use [10]. Rather, marijuana use has demonstrated a high degree of stability from adolescence to early adulthood [10, 12, 13]. SRB may show similar patterns such that behavior observed in the transition to adulthood represents a continuation of earlier patterns as opposed to an adaptation to new roles and opportunities. For example, there is evidence that youth who exhibit risk behaviors, especially substance use, during adolescence are less likely to attend college [14] and may be less likely to live with parents after high school. Continuity of behavior from high school to emerging adulthood constitutes a

competing explanation for any observed relationship between college attendance or living situation and SRB.

The relationship between college attendance and sexual risk behavior in emerging adulthood has been understudied. The present study adds to the literature by testing for associations between college attendance and living with parents and sexual risk behavior in the fall following high school. Continuity of behavior from high school to the following fall is tested as a competing hypothesis.

Methods

Sample

Participants were from the Raising Healthy Children (RHC) project, a longitudinal study of students drawn from 10 public schools in a suburban Pacific Northwest school district. RHC is a study of the etiology of problem behaviors and a randomized test of a preventive intervention. The 10 schools were paired on SES and attendance patterns. One member of each pair was randomly assigned to the experimental or treatment-as-usual control condition. Children who attended a regular first- or second-grade classroom through the spring and had a parent who spoke English, Spanish, Vietnamese, or Korean were eligible. Active consent letters were sent to eligible families. After receiving the advance letter, each family was approached through a home visit and invited to participate in the project. Further details of the RHC intervention have been reported previously [15, 16]. Nine hundred and thirty-eight first- and second-grade students and their families (76% of those eligible) consented to participate in the project in the fall of 1993. An additional 102 students who had transferred to the study schools were enrolled in the fall of the subsequent year (total $N = 1040$). Data were collected annually in the spring through grade 12 and in the fall after the final year of high school for each of the 2 grade cohorts. The original sample was gender-balanced (47% female, 53% male). The ethnic composition of the sample was 81% White, 7% Asian or Pacific Islander, 4% Hispanic, 4% Black, and 3% Native American. Approximately 29% of participants received free or reduced price school lunch in the first year of the project.

Approximately 83% ($n = 865$) of the original sample completed the interview in the fall following high school. At the fall data collection, participants ranged in age from 17.6 to 19.5 years ($M = 18.4$, $SD = .33$). Attrition was not related to gender, ethnicity, or low-income status (i.e., whether they received free/reduced price school lunch in the first 2 years of the project) at baseline. Participants who were married, divorced, or separated ($n = 18$) and participants who had been held back and were still in high school in the fall following what should have been their senior year ($n = 13$) were excluded, bringing the total sample size to 834.

Procedures

RHC questionnaires and procedures were approved by the University of Washington Institutional Review Board. Parents gave active, written consent for themselves and the target child at the start of the study. The parental consent form described the longitudinal

nature of the study, and was valid until the child reached the age of 18. Before the age of 18, students gave active, written assent each year. After age 18, students gave active consent, either in writing or over the web at each survey timepoint. The 12th-grade spring survey was administered in person between March and June (<5% of interviews were completed in July and August) using a combination of Computer-Assisted Personal Interviewing (CAPI) and Computer-Assisted Self Interviewing (CASI). Sensitive questions were self-administered. The survey in the fall following high school was administered between September and December, with a small number of interviews (<5%) completed in January of the next calendar year. Questionnaire administration was timed so that the time frames for sex-related questions would refer to a period during which those participants who attended college were at college. About half of the sample completed the survey over the Internet and half was interviewed using the combined CAPI/CASI techniques. The majority of participants living out of state who did not complete the instrument over the Web were interviewed in person; a small proportion was interviewed by phone (3%). Analyses indicate no differences in rates of reported sexual activity or risk behavior by survey mode [17].

Measures

Sexual risk behavior—Participants self-reported their sexual risk behavior in the fall following high school. Three dimensions of risk were assessed: (a) inconsistent condom use; (b) casual sex; and (c) high-risk sex. *Inconsistent condom use* was based on whether the respondent reported having either vaginal or anal intercourse without “always” using a condom. *Casual sex* was based on whether a respondent reported that they had (a) sex with someone they did not “consider to be a boyfriend or girlfriend, that is [outside of] an exclusive relationship,” (b) sex with a partner the respondent had known for less than 2 weeks, or (c) more than one sexual partner in the prior month. The use of latex condoms during vaginal and anal intercourse can reduce the spread of HIV and other sexually transmitted infections (STIs) [18–20]. In the context of a monogamous relationship with a known HIV/STI negative partner, however, unprotected sex constitutes considerably less risk. Past research has linked number of sexual partners and the probability of contracting HIV and other STIs [20]. Correct and consistent condom use with these partners, however, reduces this risk. By contrast, having unprotected sex with multiple or casual partners of unknown status is, arguably, more risky in terms of HIV and other STIs than either behavior in isolation [21]. Therefore, a *high-risk sex* variable was created based on whether participants reported having both casual and unprotected sex. Participants who reported that they had sex with a man who had sex with other men, with a partner who was HIV positive, or with an intravenous drug user also were categorized as having high-risk sex. All questions referred to the month prior to the interview.

Educational and residential status—College status was measured in the fall following high school, and was based on whether youth self-reported enrollment in a 2- or 4-year college. We combined 2-year and 4-year students because a large proportion of college students in the state of Washington begin at 2-year schools and then transfer to 4-year schools. Residential status was based on whether participants reported living with a parent in the fall following high school.

Prior risk behavior variables—Academic performance (GPA) was self-reported by participants in grades 9 – 12. These reports were averaged to obtain a measure of high school GPA. A dichotomous high school substance use variable was created by combining participant self-reports of any heavy episodic drinking (i.e., consuming 5+ drinks in a 2-hour period), cigarette smoking, or marijuana use in their last year of high school. Participants who reported any substance use were coded as users. A dichotomous high school sexual risk behavior variable was constructed by combining participant reports of having had multiple partners or used condoms inconsistently in their last year of high school, or whether they had an early sexual debut (before the spring of ninth grade). Participants endorsing any one of these behaviors were coded as having had risky sex during high school.

Relationship status and demographic control variables—In the fall following high school, participants were asked “Are you in a romantic relationship with someone (that is, do you have a steady boyfriend or girlfriend)?” in order to determine their relationship status. Ethnicity was taken from school records at the outset of the study. Age and gender were self-reported by participants. Free/reduced price lunch eligibility (childhood poverty) in the first 2 years of the study was reported by parents.

Analysis

All analyses were done using SPSS version 12. We used chi-square tests [22] to conduct preliminary analyses between dichotomous college/noncollege and living with parent/living away variables and dichotomous SRB variables. Multivariate testing was done using logistic regression [23]. For each outcome variable, a series of 2 regression models was run. The first model included control variables (gender, ethnicity, relationship status, childhood poverty), the college status variable, and the living situation variable. The second model added prior risk behavior variables to test whether associations between college status or living situation and the outcome variables persisted when high school GPA, SRB, and substance use were entered into the equation.

Care is needed when conducting etiological analyses in studies including interventions in order to minimize threats to validity. Using chi-square and logistic regression analysis, we found no evidence of intervention or cohort effects on outcome variables. Nor did we find interactions between predictors and intervention status or cohort. Therefore, intervention and control groups and cohort groups were pooled, and the full sample was used for all analyses.

Results

Descriptive Findings

About 60% of participants lived with a parent and 45% were attending college (either 2- or 4-year) in the fall following high school. Twenty-five percent of participants both lived with a parent and were attending college, 36% lived with a parent and were not attending college, 20% were attending college but did not live with a parent, and 19% neither lived with a parent nor were attending college. About 63% of participants were sexually active in the month prior to the fall interview (see Table 1). Approximately 30% of participants reported inconsistent condom use, about 23% reported engaging in casual sex, and about 11%

reported high-risk sex. The majority of the high-risk sex reported by participants consisted of casual and unprotected sex. Having sex with men who have sex with men ($n = 4$), HIV-positive partners ($n = 3$), or intravenous drug users ($n = 9$) was rare. Table 1 also shows the prevalence of each sexual risk behavior outcome by college and residential status. The prevalence of sexual risk behavior was lower among college students than among nonstudents. Nevertheless, a large proportion of college students engaged in SRB, especially unprotected intercourse (23%). No significant protective relationship between living with a parent and SRB was observed. Preliminary analyses suggest that the effect of college did not differ between those who lived with a parent and those who did not.

Table 2 displays correlations between key study variables. Consistent with the behavior continuity hypothesis, college attendance and high school GPA were negatively related to SRB, and high school SRB and substance use showed positive associations with SRB outcomes. Living situation post high school was not correlated with any of the SRB outcome variables. Living with a parent was negatively correlated with high school GPA, but was not related to SRB or substance use during high school.

Multivariate Findings

Predicting inconsistent condom use—Results from Model 1 showed a significant relationship between both being in a romantic relationship and college attendance and consistency of condom use (Table 3). Youth who were in a relationship were at increased risk of inconsistent condom use, whereas youth who were in college were at decreased risk of inconsistent condom use. Living with a parent was not related to consistency of condom use. In Model 2, however, college attendance was no longer related to the probability of inconsistent condom use. Rather, high school GPA and high school SRB were predictive of condom use consistency. Once the high school predictors were entered, African American ethnicity was associated with a decreased probability of inconsistent condom use in Model 2.

Predicting casual sex—Table 3 shows the results of the models predicting the probability of casual sex. In Model 1, both college attendance and living with a parent were associated with a lower probability of casual sex. Being in a relationship also was protective, but Hispanic and African American ethnicity were associated with increased risk for casual sex. In Model 2, the associations between college attendance and living with a parent and the probability of casual sex were no longer statistically significant. Relationships between Hispanic and African American ethnicity and casual sex also became nonsignificant in Model 2, but the protective effect of being in a relationship remained. High school GPA significantly reduced and high school risky sex and drug use significantly increased the probability of casual sex in the fall following high school.

Predicting high-risk sex—In Model 1, college attendance was the only predictor that was significantly associated with the probability of high-risk sex (see Table 3). The protective effect of college attendance remained in Model 2. Model 2 also showed main effects of high school SRB and drug use. No other predictors in Model 2 were related to the probability of high-risk sex.

For each of the three outcome variables, potential interactions between college attendance and living with a parent were tested, but were not significant. Except for GPA, we report results based on dichotomous predictors for ease of interpretation. Tests using relationship duration, as opposed to status, using each drug separately, and using number of drugs used in high school, as opposed to any drug use, resulted in patterns of significance identical to those reported here.

Discussion

This study tested the association between college attendance and living with a parent and 3 measures of sexual risk behavior in the fall following high school: inconsistent condom use, casual sex, and high-risk sex. High school sexual risk behavior, substance use, and GPA also were included in order to test the alternative hypothesis that individuals carry on preexisting patterns of behavior and these patterns may account for both selection into post-high school environments and govern behavior in these environments.

Results showed a consistent, protective effect of college status on SRB at age 18 - 19 when controlling demographic variables and relationship status in logistic regression models. Prior risk behavior and academic performance in high school, however, completely explained the observed relationship between college attendance and inconsistent condom use and casual sex. Prior risk behavior partially explained the relationship between college attendance and high-risk sex, although college attendance remained a significant and relatively strong protective variable. College students in this sample reported lower rates of SRB largely because they were more likely to do well in school and less likely to use drugs and engage in SRB during high school. Thus, patterns of behavior that had been established in high school were continued in the fall following high school. In addition, high school GPA also was related to selection into college status. Living with a parent was only protective in 1 of 6 models examined, and became nonsignificant after controlling for the high school predictors. We conclude that living with a parent is not a key predictor of SRB at age 18 - 19.

These findings are in direct contrast to theories on the transition to adulthood that argue that increased freedom and role experimentation should be associated with increased risk behavior [4, 5]. They also are in contrast to existing findings in the alcohol literature showing associations between college attendance and living away from home and increased heavy drinking in early adulthood [9, 10]. In prior studies, living away from home was more predictive of alcohol use in emerging adulthood than was college attendance. We found little evidence, however, for an association between living away from home and sexual risk behavior.

Overall, findings are more consistent with literature on marijuana use in emerging adulthood and with theory that suggests that behavior patterns established in adolescence are continued into young adulthood [10]. It is possible, however, that youth require time to adjust to the new freedoms and increased self-governance that they experience after high school. It may be that studies using a follow-up period longer than the 6-month period used here would

identify effects of college attendance and/or living away from parents that are not yet manifest in the present sample.

Limitations

The study has several strengths, including a relatively large sample size, measures of past risk behavior, and detailed questions about SRB. Nevertheless, some limitations should be kept in mind. First, although this sample included participants from multiple ethnic groups, the representation of non-White groups was not large enough for an investigation of interactions between ethnicity and college attendance or living with a parent. Second, the time frame for assessment of SRB was somewhat short – 1 month prior to the interview. This short time frame may have resulted in underestimates of the prevalence of SRB in the sample.

Conclusions

Results from this study suggest that patterns of school performance, drug use, and SRB established in high school largely explain the difference in SRB prevalence between college-attending and non-college-attending youth in the fall following high school. This suggests that prevention efforts aimed at reducing substance use and risky sex and improving academic performance during high school among all youth should result in reductions in the prevalence of SRB in the transition to adulthood. Nearly a third of young adults in this sample reported engaging in SRB, highlighting the need for universal HIV and STI prevention among this age group. In fact, strong continuity in SRB from the end of high school into early adulthood suggests that prevention efforts beginning earlier (i.e., at the start of high school) may be warranted. The protective effect of college attendance on the highest risk sex behavior suggests that youth not in college might receive special emphasis in these efforts. Preventive programming early in high school would also benefit these non-college-bound youth, who may be difficult to target once they leave high school.

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Table 1

Prevalence of past-month sexual activity and sexual risk behaviors for the full sample, by school status and by living situation.

	Full Sample	School Status		Living Situation	
		Not in College	In College	Not With Parents	With Parents
Had Sex	62.6%	70.2%	53.3% *	67.6%	59.3% *
Inconsistent Condom Use	29.5%	34.6%	23.2% *	31.8%	28.0%
Casual Sex	22.6%	28.6%	15.2% *	24.2%	21.5%
High-risk Sex	11.0%	15.9%	5.1% *	12.7%	9.9%

*
p < .05

NOTE: For school status comparisons, the reference category is "not in college." "In college." For living situation comparisons, the reference category is "not with parents."

Table 2

Intercorrelations among key study variables.

Predictor	1	2	3	4	5	6	7	8	9	10
1. Male	–									
2. Childhood Poverty	.02	–								
3. Inconsistent Condom Use	–.10*	–.01	–							
4. Casual Sex	.05	.00	.15*	–						
5. High-risk Sex	–.02	.00	.50*	.60*	–					
6. In College	–.09*	–.18*	–.13*	–.16*	–.14*	–				
7. Live With Parents	.15*	–.01	–.04	–.03	–.05	–.11*	–			
8. High School GPA	–.18*	–.13*	–.15*	–.19*	–.14*	.48*	–.16*	–		
9. High School Risky Sex	–.08*	.06	.40*	.27*	.22*	–.22*	–.05	–.19*	–	
10. High School Drug Use	–.01	.05	.24*	.32*	.21*	–.25*	–.06	–.28*	.44*	–

* $p < .05$

Table 3

Multivariate logistic regressions predicting sexual risk behavior.

Predictor	Inconsistent Condom Use		Casual Sex		High-Risk Sex	
	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)
Constant	.21 [*]	.01 [*]	.65 [*]	.20 [*]	.27 [*]	.05 [*]
Male	0.87 (0.62–1.2)	0.94 (0.64–1.4)	1.1 (0.79–1.6)	1.1 (0.74–1.6)	0.90 (0.55–1.5)	0.93 (0.55–1.6)
Childhood Poverty	0.76 (0.52–1.1)	0.75 (0.49–1.1)	0.75 (0.51–1.1)	0.65 (0.42–1.0)	0.72 (0.42–1.2)	0.68 (0.38–1.2)
Ethnicity						
Native American	1.8 (0.70–4.9)	1.1 (0.33–3.6)	1.0 (0.36–2.8)	0.86 (0.26–2.8)	1.1 (0.30–3.8)	0.70 (0.15–3.3)
Asian American	0.54 (0.24–1.2)	0.77 (0.31–1.9)	1.1 (0.54–2.4)	1.8 (0.79–4.3)	0.25 (0.03–1.9)	0.31 (0.04–2.4)
Hispanic	1.2 (0.53–2.6)	0.96 (0.39–2.4)	2.1 [*] (1.0–4.4)	2.2 (0.95–5.2)	1.5 (0.59–3.9)	1.2 (0.42–3.5)
African American	0.63 (0.23–1.7)	0.32 [*] (0.11–0.95)	2.4 [*] (1.1–5.3)	1.6 (0.66–3.8)	0.99 (0.28–3.4)	0.45 (0.10–2.0)
In a Relationship	6.9 [*] (4.8–9.9)	6.1 [*] (4.1–9.0)	0.54 [*] (0.38–0.77)	0.32 [*] (0.22–0.49)	1.1 (0.71–1.8)	0.80 (0.49–1.3)
College Attendance	0.61 [*] (0.43–0.87)	1.1 (0.71–1.7)	0.38 [*] (0.26–0.55)	0.73 (0.47–1.1)	0.28 [*] (0.16–0.48)	0.45 [*] (0.25–0.83)
Living w/Parent(s)	0.88 (0.63–1.2)	0.92 (0.63–1.3)	0.70 [*] (0.49–0.99)	0.70 (0.47–1.0)	0.66 (0.44–1.1)	0.70 (0.43–1.1)
High School GPA	–	0.74 [*] (0.58–0.94)	–	0.78 [*] (0.61–0.99)	–	0.89 (0.67–1.2)
High School Risky Sex	–	5.1 [*] (3.3–8.0)	–	3.0 [*] (1.9–4.7)	–	3.4 [*] (1.8–6.6)
High School Drug Use	–	1.5 (0.97–2.4)	–	6.1 [*] (3.4–11)	–	4.4 [*] (1.8–11)
Overall χ^2 (df)	160.64 [*] (9)	248.97 [*] (12)	48.06 [*] (9)	162.85 [*] (12)	35.85 [*] (9)	84.78 [*] (12)
χ^2 versus Model 1		88.33 [*]		114.79 [*]		48.93 [*]

* $p < .05$

Note: *CI*s for statistically significant OR's may include 1.0 due to rounding. The reference categories for comparisons are (comparison – reference group): male – female, childhood poverty (free lunch eligible) – non free lunch eligible, ethnicity – Caucasian, in a relationship – not in a relationship, in college – not in college, living with a parent – not living with a parent, high school risky sex – no risky sex in high school, and high school drug use – no drug use in high school.