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The Influence of Alcohol Intoxication on Adolescent Sexual Intercourse and Contraception Use

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Abstract

We use the method of situational decomposition in an attempt to identify the causal effect of alcohol intoxication on adolescent sexual intercourse and contraception use. This approach assumes that the relationship between frequency of alcohol intoxication and behavior *while sober* is entirely spurious. With this in mind, the *total association* between drinking and behavior can be decomposed into spurious and "non-spurious" (i.e., causal) components. The larger the magnitude of the total association relative to the spurious association, the larger the influence of alcohol on behavior. This method was employed to analyze data from the first wave of National Longitudinal Study of Adolescent to Adult Health (Add Health) in-home interview ($N = 20{,}743$). The results suggest that almost all of the relationship between alcohol and sexual intercourse is spurious. On the contrary, alcohol intoxication was found to reduce the use of contraceptives during sexual intercourse, especially among boys.

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Prior research suggests that alcohol intoxication may influence the sexual behavior of adolescents. Heavy drinking is associated with early coital debut, unsafe sexual practices, and increased risk of sexual victimization (Abbey, 2002; Claxton, DeLuca, & van Dulmen, 2015; Fergusson & Lynskey, 1996; White & Hingson, 2013). Boys sometimes encourage girls to become intoxicated in the hope it will increase willingness to engage in sex (Davis, Norris, George, Martell, & Heiman, 2006; Struckman-Johnson, Struckman-Johnson, & Anderson, 2003; Watt et al., 2012). A key issue is the question of whether alcohol intoxication has a causal effect on adolescent sexual outcomes or whether the observed relationships are spurious. In what follows, we review the theory and evidence on the causality issue and describe a novel method that assesses the degree of causal influence inherent in the association between alcohol intoxication and behavior. We then use this method to examine whether adolescent drinking affects sexual intercourse and contraceptive use.

Theory

Alcohol effects are often attributed to what has been described metaphorically as myopia or near-sightedness (e.g., George & Stoner, 2000; Steele & Josephs, 1990). Intoxication causes a restriction in attentional capacity. In sexual encounters, we should expect intoxicated individuals to be more focused on desire and less concerned about the possibilities of pregnancy, disease, and negative social consequences (e.g., MacDonald, MacDonald, Zanna, & Fong, 2000). They should be more likely to engage in sexual intercourse and less likely to use contraceptives because they are less focused on the costs. Another theoretical perspective suggests that the effects of drinking are due to expectations and a self-fulfilling prophecy. When individuals believe alcohol leads to proscribed behavior they act accordingly (e.g., Testa et al., 2006). Third, alcohol may operate as a technique of neutralization (Sykes & Matza, 1957) that provides a socially acceptable cover for engaging in deviant behavior. Individuals may avoid guilt and condemnation if they attribute deviant behavior to alcohol. Finally, the incapacitating effect of intoxication increases vulnerability to sexual abuse and assault (Felson & Burchfield, 2004).

Other theories suggest that the association between adolescent drinking and sexual behavior is, at least partly, spurious. For example, Moffitt's (1993)

developmental theory argues that contemporary adolescents are contending with what she describes as a "maturity gap." They are physiologically mature enough to participate in adult activities yet limited by social constraints. Both underage drinking and engaging in sexual intercourse can be understood as ways of coping with the maturity gap. Gottfredson and Hirschi (1990) have argued that, across each stage of human development, individual differences in self-control are the common cause of rule-breaking and related forms of risk behavior such as heavy drinking and sexual promiscuity. Sensation seeking, delinquent peer associations, and low parental supervision are additional shared risk factors that may contribute to a positive relationship between adolescent drinking and sexual intercourse.

Evidence

Establishing the effect of alcohol on sexual behavior is challenging because, for obvious reasons, experimentation is not feasible. However, experimental studies have investigated the effects of alcohol effects on *intentions* to engage in unprotected sex. Rehm, Shield, Narges, and Shuper (2011) performed a meta-analysis of 12 experiments that examined the association between blood alcohol content and self-perceived likelihood that they would use a condom during intercourse. Participants who were given alcohol were more likely to report intentions to engage in unprotected sex.

In observational research, within-individual designs have been used productively to address spuriousness stemming from *time-stable* individual differences. The evidence from these studies is mixed as to whether individuals are more likely to engage in sexual behavior on the days or occasions they are drinking alcohol. Patrick, Maggs, and Lefkowitz (2015) found that drinking on a given day was positively associated with sexual intercourse and other sexual behaviors (see also Kiene, Barta, Tennen, & Armeli, 2009; Patrick & Maggs, 2009). A study based on the daily diary method found that alcohol use among gay men was associated with increased sexual activity (Mustanski, 2008). On the contrary, Neal and Fromme (2007) did not find an association between alcohol intoxication and having sex among college students, and Leigh (1993) found a negative relationship. Finally, Cooper and Orcutt (1997) found that teenage boys, but not girls, were more likely to engage in intercourse when they consumed alcohol.

Evidence from within-person analyses of unprotected sex is also mixed. For example, Neal and Fromme (2007) found that college students who were intoxicated on a given day were more likely to have unprotected sex that day. A meta-analysis found that alcohol use was related to nonuse of condoms at first intercourse (Leigh, 2002). LaBrie, Earleywine, Schiffman,

Pedersen, and Marriot (2005) found that among sexually active male college students, alcohol consumption was negatively related to condom use with casual partners but not with romantic partners (see also Kiene et al., 2009; Mustanski, 2008; Weinhardt & Carey, 2000). Some studies comparing behavior on drinking versus nondrinking occasions suggested that alcohol use was unrelated to condom use (Bailey, Gao, & Clark, 2006; Gillmore et al., 2002; Leigh, Ames, & Stacy, 2008). Barta et al. (2008) found that, among individuals living with HIV/AIDS, alcohol use was associated with increased unprotected sex acts for men and decreased unprotected sex acts for women. Finally, the evidence is mixed on whether there are gender differences in the relationship between alcohol and unsafe sex. Some studies report a stronger association among men (Lindan et al., 1990; MacDonald, Zanna, & Fong, 1996; Weinstock, Lindan, Bolan, Kegeles, & Hearst, 1993), while others do not (Kraft & Rise, 1991; Kraft, Rise, & Traeen, 1990; Robertson & Plant, 1988; Temple & Leigh, 1992; Temple, Leigh, & Schafer, 1993; Traeen & Kvalem, 1996).

The main limitation of within-person analyses is that they cannot rule out spuriousness stemming from *time-varying* unobserved confounds. If individuals engage in activities at particular times that lead to both drinking and sexual behavior, a spurious relationship between drinking and sexual behavior will result. Teenage drinking in particular is likely to occur in party situations where the overall purpose is to "let loose" and perhaps "hook up." As an illustration of how closely substance abuse and sex are intertwined in youth party culture, consider the contemporary slang term *turnt* which—according to Urban Dictionary (2017)—can mean that someone is both "high" (intoxicated) and "horny" (sexually aroused). It is reasonable to assume that many teens go out with a joint interest in drinking alcohol and pursuing sexual encounters. Both drinking and sexual behavior are associated with an active party-oriented social life in this demographic.

Current Study

This research examines whether alcohol intoxication exerts causal influence on sexual intercourse and the use of contraception among adolescents. We expect alcohol intoxication to have a stronger causal effect on the tendency of girls to have sex since they tend to be more inhibited than boys from engaging in casual sex (e.g., Baumeister, 2000; Petersen & Hyde, 2010; Vander Ven & Beck, 2009). In addition, we predict that alcohol is more likely to affect male than female contraceptive use. We expect intoxication to reduce condom use because the decision to use a condom takes place in during

the sexual encounter (Weinhardt & Carey, 2000). As decisions about female contraceptives (e.g., birth-control pills and IUDs [intrauterine devices]) are made prior to the encounter, they are less vulnerable to the situational effects of alcohol intoxication.

We exploit a method—situational decomposition—that has previously been applied in studies of alcohol and violence (e.g., Ellonen & Aaltonen, 2012; Felson, Teasdale, & Burchfield, 2008). This method is unusual in that it does not attempt to estimate causal effects directly; instead, the size of the causal effect is inferred by calculating the difference between the total and spurious associations. As a matter of logic, if alcohol has a causal effect on behavior, this effect if contained in the total association between alcohol and behavior, and the rest of the association can be deemed as spurious (total – spurious = causal). We explain this approach in more detail below.

We recognize that some scholars are uncomfortable with the use of causal language when discussing results based on observational data. However, we agree with Hernán (2018), who argued that "using the term 'causal' is necessary to improve the quality of observational research" (p. 616). Avoiding it creates unnecessary ambiguity about the goals of the study. We believe that not only is it appropriate but also preferable to use causal language as long as one expresses the appropriate caution.

Method

Data

We used data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), a prospective nationally representative sample of American youth enrolled in middle and high school during the 1994-1995 school year (Harris, 2013; Udry, 2003). During the first stage of data collection, nearly 90,000 students from 132 middle and high schools were recruited into the sample using a school-based multistage cluster design. A subsample of youth was selected to participate in the in-home portion of the study in an effort to obtain information that is more detailed. These participants were asked about a wide range of topics including overall physical and mental health, substance use, interpersonal relationships, antisocial behaviors, and psychological traits. In total, 20,743 youth between the ages of 12 and 21 years participated in the Wave I in-home interview. We limited our analyses to Wave I since we were interested in sexual behaviors during early to mid-adolescence. The mean age of respondents during Wave I was approximately 16.

Measures

Sexual intercourse was measured by a question in which participants were asked, "have you ever had sexual intercourse?" Those who answered in the affirmative were asked a series of questions about their most recent sexual experience, including whether they were intoxicated and used birth control at the time. Based on these items, we constructed variables to be used as outcomes in our multinomial logistic regression models. First, we created a variable reflecting alcohol use during the most recent experience, coding it as follows: *never* engaged in sexual intercourse (reference category), *sober*, and *intoxicated*. Second, we created a variable reflecting alcohol and contraceptive use during the most recent coital experience. This was coded as "used contraception" (reference category), "sober and did not use contraception," and "intoxicated and did not use contraception." The analyses using this variable were limited to the respondents who had engaged in sexual intercourse ($n = 8{,}146$).

Frequency of intoxication was measured by asking participants how often they had gotten drunk in the past 12 months. Responses were coded into three categories: 1 = *never*, 2 = *occasionally* (less than once per week), and 3 = *frequently* (at least once a week).

Method of Estimation

A method known as *situational decomposition* (e.g., Felson, Savolainen, Berg, & Ellonen, 2013) was used to identify the spurious portion of the total relationship between alcohol intoxication and sexual behavior. This method was developed for investigating the effects of situational variables in cross-sectional studies featuring frequency data and joint-occurrence data. As reported above, the data source used in the present investigation includes questions about frequency of intoxicated drinking, whether the participants had engaged in sexual intercourse, and whether they were intoxicated at the time of the coital experience.

The analysis is based on a comparison between two regression equations. In the first equation, binary logistic regression was used to estimate the *total association* between intoxication frequency and sexual intercourse. This estimate includes both the putative causal effect of alcohol intoxication on sexual intercourse and the spurious portion. The second equation generates an estimate of the size of the spurious (i.e., noncausal) portion of the total association. This equation is estimated using multinomial logistic regression where a three-category coital outcome is regressed on intoxication frequency. We assume that the relationship between intoxication frequency and sober sex

(vs. no sex) is entirely spurious since intoxication cannot have a (situational) effect on engaging in sex while sober.

The *comparison* of the two equations provides evidence as to the degree of causality in the total relationship between intoxication frequency and sexual intercourse. The degree of causality is zero if the magnitude of the total association and the magnitude of the spurious association are equal; this outcome would indicate that the total association is entirely spurious and thus there is no "room" for causality in the association. The smaller the size of the spurious association relative to the total association, the larger the relative size of the (implied) causal effect. Recall that, by definition, any share of the total association that is not spurious must be understood as "causal."

The same logic is used in the models of contraception use, but the analysis is limited to adolescents who had engaged in sexual intercourse. The first equation establishes the relationship between frequency of intoxication and whether the respondent had used contraception during intercourse, and the second equation estimates a multinomial logistic regression equation with three outcome categories: (a) no contraception use while intoxicated, (b) no contraception use while sober, and (c) used contraception during intercourse (the reference category).

The method of situational decomposition has some notable advantages over the more typical alternatives. First, measurement error is less problematic because we are comparing the relative size of coefficients and not depending on their absolute size. Self-reports of the frequency of drinking are likely to have measurement error, but it should not affect the *relative* size of the observed coefficients. For the same reason, it does not matter that we measure only one situational outcome. Second, our method does not require us to control for sources of comorbidity. Confounders are captured in the estimate representing the spurious component of the total association. Controlling for every possible confounder is always a problem with observational data, but especially challenging in situations that involve such etiologically overlapping outcomes as adolescent drinking and sex. Within-person studies control for time-stable individual differences, but fail to address time-varying confounding factors. In sum, the method of situational decomposition is less vulnerable to errors of measurement and specification.

Results

Table 1 presents descriptive statistics for the analytic variables. The results show that 42% of male and 38% of female respondents report having engaged in sexual intercourse at the time of Wave I interviews. An overwhelming majority of the respondents were sober during the most recent

Table 1. Univariate Statistics of Analytic Variables.

	Full sample		Males		Females	
Variables	%	*n*	%	*n*	%	*n*
Sexual intercourse						
Never	59.72	12,225	57.83	5,851	61.56	6,374
Sober intercourse (most recent)	38.65	7,913	40.09	4,056	37.25	3,857
Intoxicated intercourse (most recent)	1.63	334	2.09	211	1.19	123
Total	100	20,472	100	10,118	100	10,354
Contraception use (most recent intercourse)						
Used contraception	66.40	5,409	69.35	2,917	63.25	2,492
No contraception during sober sex	30.44	2,480	27.32	1,149	33.78	1,331
No contraception during intoxicated sex	3.15	257	3.33	140	2.97	117
Total	100	8,146	100	4,206	100	3,940
Intoxication frequency in past year						
Never	71.82	14,871	70.11	7,178	73.50	7,693
Occasionally	22.71	4,703	22.71	2,325	22.72	2,378
Frequently	5.46	1,131	7.18	735	3.78	396
Total	100	20,743	100	10,238	100	10,467

sexual intercourse. Approximately 5% of males and 3% of females who had experienced sexual intercourse report having been under the influence of alcohol during the most recent intercourse event.

The table also shows that about one third of the coital encounters did not involve the use of contraception, and about 10% of those cases took place under the influence of alcohol. Finally, about 72% of the respondents report that they were never intoxicated during the past year. Boys were more likely than girls to have been frequently intoxicated (7.18% vs. 3.78%).

Sexual Intercourse

In Table 2, we present our analyses of the relationship between intoxication and sexual intercourse for the full sample and separately for boys and girls. Model 1 involves estimation of the *total* effect of intoxication frequency on intercourse (intoxicated or not) based on binary logistic regression. The results document very strong statistically significant associations. The odds of sexual intercourse were 8.69 times higher for boys who are frequently

Table 2. Logistic and Multinomial Regression Models of Sexual Intercourse.

	Model 1: Binary logistic regression			Model 2: Multinomial logistic regression			
	Sexual intercourse (total)			Sexual intercourse while sober			
	b	95% CI	OR	*b*	95% CI	RRR	Spuriousness[a]
Full sample ($n = 20{,}440$)							
Frequency of intoxication							
Occasionally	1.38**	[1.31, 1.45]	3.98	1.32**	[1.25, 1.39]	3.76	95.7%
Frequently	2.14**	[1.99, 2.28]	8.48	1.96**	[1.82, 2.11]	7.13	91.6%
Male sample ($n = 10{,}099$)							
Frequency of intoxication							
Occasionally	1.27**	[1.17, 1.39]	3.57	1.21**	[1.11, 1.31]	3.35	95.3%
Frequently	2.16**	[1.97, 2.35]	8.69	1.97**	[1.77, 2.16]	7.14	91.2%
Female sample ($n = 10{,}341$)							
Frequency of intoxication							
Occasionally	1.48**	[1.39, 1.58]	4.41	1.44**	[1.34, 1.54]	4.21	97.3%
Frequently	2.04**	[1.81, 2.27]	7.69	1.91**	[1.67, 2.15]	6.77	93.6%

Note. The first set of columns (Model 1) presents results from a logistic regression model and the second set of columns (Model 2) presents results from a multinomial logistic regression model with no intercourse as the base outcome and omitting results for intoxicated sex outcome category. CI = confidence interval; OR = odds ratio; RRR = relative risk ratio.

[a]The coefficient for sober coitus (*b* in Model 2) as a percentage of the coefficient for any coitus (*b* in Model 1).

$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

intoxicated than for boys who never drink (reference category). The effect is weaker for those who get drunk "occasionally" (less than once per week) but remains strong (odds ratio [OR] = 3.57). A similar pattern was observed for females. The results show that adolescents who are frequently intoxicated are much more likely to engage in sexual intercourse, but the question remains: How much of the total association is due to the causal influence of alcohol intoxication?

Model 2 shows the association between intoxication frequency and sexual intercourse *while sober*. Recall that these coefficients were generated with a multinomial logistic regression model featuring a three-category outcome: no intercourse (reference category), sober intercourse, and intoxicated intercourse. To simplify the presentation, the analytically irrelevant coefficients for sexual intercourse while intoxicated are omitted from Table 2.

Following the logic of situational decomposition, we identify the causal effect of intoxication by comparing the coefficients for sober intercourse (Model 2) to the coefficients for any intercourse (Model 1). The results of this comparison are presented in the last column where we show the coefficient for sober sexual intercourse as a percentage of the total association. The results indicate that, for both boys and girls, the coefficients for sober intercourse are almost as large as the coefficients for any intercourse. The spuriousness percentages all exceed 90%, which suggests that *the strong overall relationship between intoxication frequency and sexual intercourse is almost entirely spurious*. Interpreting the leftover share of the total association as the estimate of the causal association, the results *contradict* the hypothesis that the intoxication effect is larger for girls than boys.

Confidence intervals (CI) are reported in Table 2 to address the issue of statistical significance of the observed differences. We can focus on the unstandardized coefficients (*b*) for the full sample since we did not observe evidence of gender difference. The results show that the difference between total and sober associations for frequent intoxication is statistically significant at the $p < .05$ level; the estimate for the total association is within the CI of the estimate for the sober association. This is not the case for occasional drinking. Thus, we conclude that 8.4% of the total association between frequent heavy drinking and adolescent sexual intercourse can be attributed to the causal effect of alcohol intoxication.

Contraception Use

In Table 3, we present our analyses of contraception use focusing on respondents who had engaged in sexual intercourse. The results from binary logistic regression analyses (Model 1) indicate that boys and girls who were

Table 3. Logistic Regression Models of Contraception Use During Intercourse.

	Model 1: Binary logistic regression			Model 2: Multinomial logistic regression			
	No contraception during any sex			No contraception during sober sex			
	b	95% CI	OR	*b*	95% CI	RRR	Spuriousness[a]
Full sample (n = 8,144)							
Frequency of intoxication							
Occasionally	.04	[−0.05, 0.14]	1.05	−.02	[−0.12, 0.08]	.98	NA
Frequently	.32**	[0.17, 0.47]	1.38	.15†	[−0.01, 0.30]	1.16	46.9%
Male sample (n = 4,204)							
Frequency of intoxication							
Occasionally	.00	[−0.14, 0.15]	1.00	–.08	[−0.22, 0.07]	.92	NA
Frequently	.34**	[0.14, 0.53]	1.40	.14	[−0.06, 0.34]	1.15	41.1%
Female sample (n = 3,940)							
Occasionally	.07	[−0.07, 0.21]	1.07	.02	[−0.12, 0.16]	1.02	NA
Frequently	.41**	[0.17, 0.66]	1.51	.28*	[0.02, 0.53]	1.32	68.3%

Note. The first set of columns (Model 1) presents results from a logistic regression model and the second set of columns (Model 2) presents results from a multinomial logistic regression model with intercourse using contraception as the base outcome and omitting results for the outcome category indicating no contraception use during intoxicated sex. CI = confidence interval; OR = odds ratio; RRR = relative risk ratio.

[a]The coefficient for sober unsafe coitus (*b* in Model 2) as a percentage of the coefficient for any unsafe sex (*b* in Model 1).

†$p < .10$. *$p < .05$. **$p < .01$.

occasionally intoxicated were just as likely to have used contraceptives as those who never drink to the point of intoxication. However, adolescents in the *frequently* intoxicated category were somewhat more likely to have engaged in sex without contraception (the odds ratios are 1.40 and 1.51 for boys and girls, respectively).

A comparison of the results for Models 1 and 2 suggests that the spurious association between frequent intoxication and contraception use during *sober* sex (Model 2) is substantially weaker than the total association reported in Model 1. In the full sample, the size of the sober coefficient is less than one half of the total association ($b = .15$ compared with $b = .32$). Because the accompanying 95% CIs for the total association the sober coefficient do not overlap, the two associations can be considered significantly different from one another. Thus, following the logic of the method, as much as 53% of the total association between frequent intoxication and engaging in intercourse without contraception reflects causal influence.

The results from the gender-specific models support the hypothesis that the effect of intoxication on contraception use is stronger among boys. Comparing the CIs between boys and girls, we observe that the difference for boys falls just outside of conventional levels of statistical significance while the difference for girls is not significant. The failure to find significant differences in the gender-disaggregated analyses is likely due to reduced statistical power.

The main results from the Tables are summarized in Figure 1, where we display the relative size of the nonspurious (i.e., causal) component in the total association between frequent intoxications and sexual intercourse and contraception use during intercourse. Results show that heavy drinking has, at best, a very small effect on adolescent sexual intercourse. The association is almost entirely spurious. By contrast, among the sexually active youth, heavy drinking increases the risk of unsafe sex considerably. This effect is especially strong among adolescent boys.

Discussion

Laboratory experiments have demonstrated that alcohol has a causal effect on a variety of behaviors. Because such experiments are not feasible in the study of intimate sexual behavior, researchers must base their inferences on observational data. The identification of causal effects in this area is particularly challenging because alcohol use and sexual behavior have common risk factors, especially among adolescents. To address this challenge,

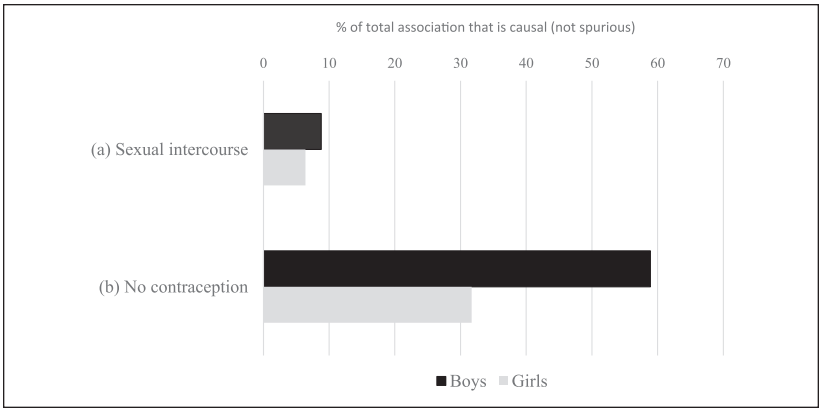

Figure 1. The magnitude of the causal association relative the total association between frequent intoxication and (a) sexual intercourse and (b) contraception use during intercourse.

researchers have relied on longitudinal studies using within-person designs. These methods are useful for controlling stable individual differences, but they cannot control for unobserved time-varying factors because some of the confounders in the relationship between alcohol and sexual behavior are likely to vary over time.

The current study applied the method of situational decomposition to determine the extent to which alcohol intoxication influences the decision to engage in sexual intercourse and to use contraception. Using this method, we found the association between intoxicated drinking and sexual intercourse to be almost entirely spurious. The overlap between the total and sober associations varied between 91% and 97%. These results suggest that adolescent drinking has very little impact on whether they engage in sexual intercourse. Nor was there support for the hypothesis that the effect of alcohol on sexual intercourse is stronger among girls.

The idea that alcohol has, at most, a weak effect on sexual intercourse challenges the assumption that adolescent drinking behavior is an important factor in this sexual outcome. Our results suggest that adolescents may sometimes use alcohol as an excuse or a neutralization technique for their sexual behavior (Vander Ven & Beck, 2009), but when they want to have sex, they will do so regardless of whether they are intoxicated. Thus, it does not appear to be an effective strategy for boys to encourage girls to drink to increase their willingness to engage in sex. However, it is worth noting that the present

study did not examine the effect of alcohol on sexual assaults. Evidence from prior research suggests that alcohol intoxication does increase the risk of sexual victimization (Abbey, 2002; Felson & Burchfield, 2004), and research on violence generally suggests that alcohol has a causal effect on violence (e.g., Felson et al., 2008; for a review, see Exum, 2006).

The results were different in the analysis of contraception use during sexual intercourse. Although we observed a fair amount of spuriousness in the relationship between alcohol intoxication and engaging sexual intercourse without the use of contraception, the total association was substantially stronger, implying evidence of causal influence. Both boys and girls were found to be less likely to use contraception when they were under the influence of alcohol. The effect was stronger for boys, in support of our hypothesis and some previous studies. We proposed that decisions about male contraception are more likely than decisions about female contraception to be made during the sexual encounter. Decisions about birth-control pills and IUDs are usually made during times when alcohol is not a factor.

Why should intoxication influence adolescent decisions about contraception but have no effect on their decisions about engaging in sexual intercourse in the first place? Alcohol myopia theory suggests an answer. Perhaps it is because most adolescents have positive attitudes toward engaging in sex (Suvivuo, Tossavainen, & Kontula, 2010; Tolman, 2002). Sexual activity is not deviant behavior during adolescence, it is normative. If short-term sexual desire is consistent with attitudes about sexual activity, alcohol should not have a myopic effect; the discounting of long-term costs and goals is not a factor. On the contrary, pregnancy and sexually transmitted diseases are long-term costs that are inconsistent with normative desire. A myopic state of mind, due to alcohol intoxication, may lead adolescents to pay less attention to these costs, resulting in failure to use of contraceptives.

The results are also inconsistent with the idea that alcohol effects are due to expectations and a self-fulfilling prophecy. If expectations had an effect, we should have found evidence for causality. It is not clear whether adolescents have clear expectations about the effect of alcohol on contraceptive use, where we did find evidence of causality. In addition, the lack of an alcohol effect does not support the idea that alcohol provides an excuse for sexual behavior. Alcohol may be used *afterward* as an excuse for engaging in sexual behavior but it does not appear to be providing the permission. It may also be used as an excuse for failing to use contraceptives but it seems unlikely that the excuse provides permission to neglect contraceptive use. We recognize, however, that excuses and expectations may have small effects that we were unable to detect.

Our results suggest that we should not expect programs designed to reduce drinking among adolescents to affect their sexual behavior.

Apparently, adolescents are going to engage in sexual intercourse whether they are intoxicated or sober. However, prevention programs may have an effect on whether adolescents use contraception when they do engage in sexual intercourse. Any such effects are unlikely to be substantial since most adolescents appear to be sober when they have intercourse.

Limitations

Confidence in our conclusions depends on the adequacy of our method for separating causality and spuriousness in examining situational effects. As noted, compared with the standard alternatives, situational decomposition is less vulnerable to errors in measurement and specification. However, the usual validity problems associated with self-report data still apply. Some adolescents may not recall whether they had been drinking alcohol during their most recent sexual intercourse. As a sensitivity check, we repeated the analyses with coital debut as the outcome; we assume most individuals remember if they were sober or not during their first intercourse. The results—not presented but available from authors—were similar to the ones reported here.

We recognize that data from the first wave of the Add Health is somewhat dated and that it is limited to a single cultural context. It is possible that the effects of alcohol on adolescent sexual behavior vary across time and place. Finally, it was not possible in this data set to determine the intimacy of the relationship between the respondent and the sexual partner. It is possible that alcohol has a stronger effect on casual sex. Future research can address these limitations if joint-occurrence data on drinking and sexual behavior is available.

Conclusion

In sum, evidence from this research suggests that alcohol has little influence on adolescents' decision to engage in sexual intercourse, but substantial impact on whether they use contraception during sex. The strong association between alcohol and sexual behavior is mostly spurious. The widely held belief that alcohol intoxication increases the willingness of girls to engage in sexual behavior may be largely a myth. Instead, it appears that alcohol leads adolescents, particularly boys, to behave irresponsibly during sex.

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