

## The Relationship Between Drug Use and Sexual Aggression in Men Across Time

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### **Abstract:**

The relationship between drug use and sexual aggression in a sample of men was examined at five time points from adolescence through the 4th year of college. Hierarchical linear modeling explored the relationship between proximal drug use and severity of sexual aggression after controlling for proximal alcohol use at each time period. Results revealed that proximal drug use was associated with sexual aggression severity: Increased drug use predicted increased severity of sexual aggression across time. A second set of analyses explored the relationship between distal marijuana use and severity of sexual aggression after controlling for distal alcohol use. Results indicated that increased marijuana use predicted increased severity of sexual aggression across time. A third set of analyses explored the relationship between distal use of other illicit drugs and severity of sexual aggression after controlling for distal alcohol use. Results mirrored those of the second set of analyses and are discussed in terms of drug use as a component of deviant lifestyles that may include sexually aggressive behavior, including implications for applied settings.

### **Article:**

College-age men, on average, display a relatively high rate of sexually aggressive behavior (Koss, Gidycz, & Wisniewski, 1987). According to a national survey of college men, 25.1% reported engaging in at least one instance of sexually aggressive behavior subsequent to the age of 14. Moreover, 7.7% of the men reported engaging in behavior that met the legal definition of *rape* or *attempted rape* (Koss et al., 1987). These figures have been supported in more recently published studies (White & Smith, 2004). Researchers have established many links between male sexual aggression and alcohol-related factors (e.g., Abbey, Zawacki, Buck, Clinton, & McAuslan, 2001; Ullman, 2003); however, much less is known about a link between male sexual aggression and drug-related factors. The current research intends to fill this void in the literature by examining the relationships between both proximal and distal drug use and male sexual aggression.

Previous research has relied heavily on victim accounts of level of perpetrator drunkenness or drug intoxication at the time of the sexual assault. Correlations between first- and second-hand reports regarding substance use leave a great deal of variance unexplained—with first-hand reports shown to be more accurate than second-hand reports (Goldstein, 1966); there is an especially large discrepancy between first- and second-hand reports concerning level of

substance use (i.e., how much of a substance a person used at a given time). This is especially relevant to researchers who seek to measure a perpetrator's level of intoxication at the time of an aggressive encounter. Although the underreporting of substance use is an ongoing concern, it is assumed that self-report is more accurate than that of another—such as a peer or dating partner.

Collecting personal information such as substance use patterns, perpetration or victimization histories, or presence of psychopathologies directly from sexual perpetrators, however, has proven to be a difficult task for researchers in this field. Sexual perpetrators do not easily stand out in society, and only a small percentage of them are brought to justice. Moreover, information concerning the lifestyles or psychological adjustment of those men who are brought to justice is rarely collected or made available to researchers for analysis. Men who are “caught” may not represent the population of sexually aggressive men, as most of them do not end up in prison, which in turn necessitates studying a broader sample (Malamuth, Check, & Briere, 1986).

In the present research, we had the opportunity to analyze longitudinal data collected via self-report directly from sexually aggressive men in a college sample. We are able, therefore, to test novel hypotheses concerning substance use patterns of sexually aggressive men. The purpose of the present research is to examine the possible link between substance use and sexual aggression in men. In the next section, we review the relevant literature on the link between sexual aggression and alcohol use. We examine this link first because it has been extensively studied; thus, this literature provides guidance in establishing a link between sexual aggression and drug use.

## SEXUAL AGGRESSION AND ALCOHOL USE

Alcohol use has been asserted as one of many situational factors linked to sexual aggression. Researchers estimate that 50% to 74% of sexual assaults are perpetrated by men who recently used alcohol (Abbey et al., 2001; Koss, 1988; Pernanen, 1991). The Campus Sexual Assault Study (Krebs, Lindquist, Warner, Fisher, & Martin, 2007) reported that, of the men who endorsed attempted or completed sexual assault, 81% reported that they had been drinking before the incident. Of these men who had been drinking, 94% of them reported being drunk before the assault occurred. Women reported that dates in which they experienced sexual aggression were more likely to include heavy drug or alcohol use compared with dates in which there was no aggression (Muehlenhard & Linton, 1987). Most studies have reported that victim and perpetrator alcohol use is highly correlated, making interpretation of the respective effects of each person's alcohol use on the occurrence and outcome of any sexual aggression nearly impossible. Two studies were able to isolate perpetrator alcohol use and showed that in cases where perpetrators were using alcohol, and victims were not, there was a higher percentage of both rape completion and victim injury than when both parties were using alcohol (Brecklin & Ullman, 2002; Ullman & Brecklin, 2000). It is possible that alcohol use increases perpetrators' aggression, whereas lack of alcohol use increases victims' resistance. This is not to suggest that alcohol use is a causal factor in sexual assaults; it is unlikely that alcohol causes a man to become sexually aggressive if he does not already possess such tendencies (Seto & Barbaree, 1995). It is more likely that alcohol use aids the perpetrator in overcoming personal inhibitions toward sexual aggression by decreasing perceived responsibility for his actions (Abbey, Ross, McDuffie, & McAuslan, 1996). It has also been posited that situations conducive to sexual aggression may include alcohol (e.g., bars or large parties; Lackie & de Man, 1997).

There is disagreement within the literature concerning a distal link between alcohol use and sexual aggression. This disagreement may stem from the manner in which researchers define the constructs under consideration. Although researchers typically use the Sexual Experiences Survey to assess sexual aggression (SES; Koss et al., 1987), there is little agreement on how to operationally define distal alcohol use. For instance, Ouimette (1997) defined it as reporting symptoms of or meeting a clinical diagnosis for alcohol abuse or dependence, whereas Koss and Gaines (1993) used a less restrictive definition by measuring intensity of alcohol use ranging on an ordinal scale from “I do not drink” to “When I drink I get wasted.” Both definitions resulted in findings suggestive of a positive correlation between alcohol use and severity of sexual aggression.

Other researchers have found a null relationship between frequency of alcohol consumption and sexual aggression severity—assessed via the SES (Calhoun, Bernat, Clum, & Frame, 1997; Lackie & de Man, 1997; Rubenzahl & Corcoran, 1998). Most researchers in the field, however, agree that there is an association between male sexual aggression and a history that includes binge drinking (O’Leary & Schumacher, 2003) and general heavy alcohol use (Abbey, Ross, & McDuffie, 1994; Berkowitz, 1992; Koss & Dinero, 1988). It is likely that these conflicting results are due to the differences in how alcohol use was operationally defined. Those who simply measure frequency of alcohol consumption (e.g., Calhoun et al., 1997) tend to find a null relationship with sexual aggression severity, whereas those who take levels of consumption into account (e.g., Koss & Gaines, 1993) tend to support this relationship. This explanation supports the argument that it may not be the effect that alcohol has on the person that leads to the sexually aggressive behavior; rather, it is more likely that the increases in sexually aggressive behavior are a byproduct of a lifestyle that includes increased levels, but not necessarily increased frequency, of alcohol consumption.

#### SEXUAL AGGRESSION AND DRUG USE

Compared to research on alcohol, the literature on the relationship between drug use and violence against women is sparse (Fals-Stewart, Golden, & Schumacher, 2003). The few studies that have examined this relationship were unable to separate the effects of drugs and alcohol, and they have frequently grouped these substances together for analyses. Although these analyses are informative, there is a clear need to examine these agents separately. Kilpatrick, Acierno, Resnick, Saunders, and Best (1997) examined women’s drug and alcohol use respectively. They found that women’s drug use, but not alcohol use, was related to later sexual victimization after controlling for previous victimization. It is possible that the relationship between women’s drug use and their victimization may be a function of their relationships with men who also use drugs (Testa, 2004). Women who use drugs often associate with peers who do the same (Elliott, Huizinga, & Ageton, 1985; Krohn, Lizotte, Thorneberry, & Smith, 1996); perhaps, in their male peers, increased levels of drug use are related to increased levels of sexual aggression. Drug use may be a factor that brings victims close to a group of men with relatively high levels of sexual aggression.

Marijuana is one of the few drugs that has been explored in relation to violence against women. There are conflicting findings, however, within the literature concerning the proximal relationship between marijuana and male-to-female physical aggression. Among men arrested

for violent crime and ordered to attend batterer counseling, marijuana use was predictive of physical violence perpetration, even after controlling for perpetrator alcohol use (Stuart et al., 2008). However, no association was found when this relationship was assessed longitudinally using a sample of men who were in treatment for drug abuse (Fals-Stewart et al., 2003). Regardless, the context for physical and sexual aggression may be sufficiently different to question generalizing from one to the other (Swartout & White, 2007). Marijuana use is illegal in the United States; however, a recent survey found that 40% of Americans aged 12 or older have tried it at least once (Substance Abuse and Mental Health Services Administration, 2004). People who choose to use it recreationally at increasing levels are likely to engage in other risky behaviors (Bell, Wechsler, & Johnston, 1997; Lane, Yechiam, & Busemeyer, 2006), resulting in an increasingly deviant lifestyle—a lifestyle that has recently been found to include violence against women (Stuart et al., 2008).

## THE PRESENT STUDY

Prior research on substance use and sexual assault has yet to establish a relationship between marijuana use, other drug use, and sexual aggression severity despite a call within the literature to do so (Testa, 2004). In the present study, the effects of drug and alcohol use on sexual aggression severity were separated. Most research in this area restricts its scope to either proximal or distal relationships between substance use and sexual aggression severity; this study approaches the topic from both standpoints by reporting the relationships between sexual aggression severity and both situational drug use and general frequency of drug use.

Drawing data from a 5-year longitudinal data set, the present research analyzes the relationships between men's drug use and sexual aggression over time. In examining the proximal relationship between drug use and sexual aggression, drug use was analyzed as one class of substances. Alternatively, when examining the distal relationship between drug use and sexual aggression, drug use was separated into two classes: "marijuana use" and "other illicit drug use." First, we hypothesized that situational drug use would positively and significantly predict severity of sexual aggression at each point in time. To disentangle the effects of situational drug use from alcohol use, situational alcohol use was controlled for in the analysis. Second, we hypothesized that frequency of distal marijuana use would positively and significantly predict severity of sexual aggression at each point in time after controlling for the effects of frequency of alcohol use. Finally, we hypothesized that frequency of distal illicit drug use (other than marijuana) would positively and significantly predict severity of sexual aggression at each point in time after controlling for the effects of frequency of alcohol use.

## METHOD

### *Participants*

The data used in these analyses come from a larger longitudinal study of social experiences (see White & Smith, 2004). Men from three incoming classes ( $N = 851$ ) at a medium-sized state university were asked to complete a series of five questionnaires over a 4-year period. Participants completed the first set of surveys upon initially entering the university, and the subsequent four sets of data were collected in the spring semester of their freshman, sophomore, junior, and senior years of college. Yearly retention averaged 71%. Participants were paid \$15 upon the completion of the set of surveys each spring. All men were traditional college students who were between age 18 and 19 at the time of the first set of surveys. This university is

considered to be representative of all state universities, the type that 80% of all U.S. college students attend (The Carnegie Foundation for the Advancement of Teaching, 1987). Furthermore, a federal certificate of confidentiality was obtained from the National Institutes of Mental Health to enhance students' confidence that their information was indeed protected.

### *Procedure*

For the purposes of the present study, a subsample was constructed that was restricted to the men who reported engaging in sexual activity during adolescence ( $N = 621$ ). Within this subsample, the average participant age was 18.5 at the first time point; approximately 26.2% were African American, 68.3% were Caucasian, and 5.5% belonged to other ethnic groups; and 23% ( $n = 143$ ) of the subsample of men completed all 5 sets of surveys across the 4 years. Of this final group, 12.4% were African American, 82.5% were White, and 5.2% belonged to other ethnic groups. Analyses indicated no significant differences as a function of the dependent variable used in this study (severity of sexual aggression) between men who completed all five time points and those who completed only one, two, three, or four time points. There was a significant difference as a function of frequency of marijuana use during adolescence only; there were no differences as a function of marijuana use during the subsequent college years.

### *Measures*

**Sexual perpetration experiences.** Sexual perpetration was assessed using the SES (Koss et al., 1987), to categorize men's sexual experiences into one of six levels: (1) none,<sup>1</sup> (2) consensual only, (3) unwanted contact, (4) verbal coercion, (5) attempted rape, or (6) rape. These categorizations were based on responses to 11 items that were ordered in terms of severity from only consensual experiences to rape. For the purposes of this research, the severity of participants' sexual aggression was analyzed. Participants were, therefore, categorized by their most sexually aggressive act reported at each time point—each participant had 5 scores, each of which could range from 1 to 6 during 4 years of college. This served as the outcome variable in the analyses.

**Situational drinking and drug use.** The situational drinking and drug use measures stemmed from a set of follow-up questions to the SES. Participants were asked to identify the last item on the SES they endorsed. They were then asked to think back to that experience to answer a set of specific questions regarding their relationship to the victim and features of the situation: "Regarding this experience, were you drinking at the time?" and "Regarding this experience, were you using drugs at the time?" For each question, participants could endorse: (a) "No"; (b) "Yes, but I was not intoxicated/high"; (c) "Yes, I was somewhat intoxicated/high"; or (d) "Yes, I was very intoxicated/high."

**Frequency of drinking and drug use.** Men's general drinking and drug use habits were assessed using three questions. The specific questions were "How often do you drink alcohol?" "How often do you use marijuana?" and "How often do you use drugs other than alcohol or marijuana?" (all with responses on a 5-point scale ranging from *never* to *more than twice a week* within the past year). Questions of frequency were the only questions posed to participants regarding marijuana and other illicit drug use specifically. Although data on other measures of alcohol use were collected, frequency of drinking was used in these analyses to coincide with the

measurement of marijuana and other drug use because alcohol use serves as a covariate in this study.

## RESULTS

### *Data Analysis Strategy*

All hypotheses were tested using hierarchical linear modeling (HLM). Essentially, the first level of an HLM equation resembles a multiple regression equation. There is an intercept and multiple slopes that estimate the relationship between variables. Each Level 1 equation, however, represents either a time point within a person (the first analysis) or a time point within a specified group of people determined by people's mean responses to a variable (the second analysis). To be clear, the trajectories provided by the intercepts and slopes of Level 1 vary within Level 2; the purpose of HLM is to explain this variability (Raudenbush & Byrk, 2002).

### *Level of Sexual Aggression Across Time*

White and Smith (2004) previously described the percentage of men engaging in sexual aggression at each point in time. They found that these percentages consistently decreased between adolescence and the 4th year of college (22.4%, 13.4%, 12.1%, 12.4%, and 7.6% respectively). Furthermore, the present study found that sexual aggression severity, at the person level, significantly and consistently decreased over time.<sup>2</sup> This trajectory was judged by the relationship between the time and sexual aggression variables,  $\pi_{1j} = -0.087$ ,  $SE = 0.022$ ,  $t(1226) = 4.00$ ,  $p < .001$ . Taken together, these results suggest that not only did the percentage of men engaging in sexually aggressive behavior decrease across time, but also the severity of the sexual aggression perpetrated decreased across time. Therefore, men who engaged in sexual aggression did so at decreasingly severe levels across time.

### *Proximal Substance Use and Sexual Aggression<sup>3</sup>*

A random coefficients model was used to assess the relationship between proximal substance use (i.e., level of intoxication) and sexual aggression. Severity of sexual aggression was the outcome variable in the first analysis. Proximal drug use and time were modeled as uncentered variables; proximal alcohol use was a covariate. The participant ID variable stood alone at the second level of this model. The intercept of this model was interpreted as the severity of sexual aggression of a man who reports no situational drug use at the first time point (adolescence), after adjusting for level of situational alcohol use. The variance coefficients corresponding to the intercept and proximal drug use variable were modeled as random effects.<sup>4</sup>

In a test of our first hypothesis, proximal drug use was a positive and significant predictor of sexual aggression severity at each point in time,  $\pi_{2j} = 0.216$ ,  $SE = 0.094$ ,  $t(705) = 2.305$ ,  $p = .021$ , after controlling for the variance associated with proximal alcohol use.<sup>5</sup> This clearly indicates a significant relationship between the proximal effects of drug use and sexual aggression severity.

### *Distal Drug Use and Sexual Aggression: Marijuana<sup>6</sup>*

Table 1 represents the percentages of men who reported marijuana use during each year of the study grouped by their reported level of sexual aggression. This table suggests, in general, that men who reported increasing levels of sexual aggression were more likely to also report marijuana use.

**Table 1:** Men Who Reported Marijuana Use during Each Year of the Study Grouped by Their Reported Level of Sexual Aggression

|                   | TIME POINTS  |              |              |              |              |
|-------------------|--------------|--------------|--------------|--------------|--------------|
|                   | Time 1       | Time 2       | Time 3       | Time 4       | Time 5       |
| Sexual Experience | <i>n</i> (%) |
| Consensual        | 131 (31.3)   | 170 (50.7)   | 121 (49.2)   | 60 (35.5)    | 34 (38.2)    |
| Verbal coercion   | 28 (33.7)    | 16 (43.2)    | 14 (56)      | 5 (29.4)     | 0            |
| Unwanted Contact  | 24 (53.3)    | 13 (54.2)    | 10 (76.9)    | 2 (40)       | 1 (100)      |
| Attempted rape    | 4 (44.4)     | 5 (83.3)     | 4 (80)       | 0            | 0            |
| Rape              | 23 (52.3)    | 15 (75)      | 10 (83.3)    | 8 (66.7)     | 0            |

Note: Percentages represent proportion of men using marijuana within each category of sexual experience at each time point.

HLM allowed us to test the general hypothesis that the severity of sexual aggression and distal drug use (i.e., frequency of drug use) are related after controlling for alcohol use more specifically in two ways. First, within individual men, changes in levels of sexual aggression will be associated with changes in levels of distal drug use. That is, for a given individual, any changes across time in level of sexual aggression would be associated with a change in level of distal drug use. This hypothesis was tested using a random coefficients model with level of sexual aggression as the outcome variable, distal marijuana and alcohol use as Level 1 predictor variables, and participant ID as the grouping variable at Level 2. The distal alcohol use variable was controlled for via group-mean centering; because it was the variable of interest in this analysis, the distal marijuana use variable was not centered. The intercept and distal marijuana use variable were modeled as random effects.<sup>7</sup> The intercept was significant:  $\pi_{0j} = 0.485$ ,  $SE = 0.044$ ,  $t(688) = 11.114$ ,  $p < .001$ . Distal marijuana use was found to be a significant positive predictor of severity of sexual aggression:  $\pi_{1j} = 0.119$ ,  $SE = 0.031$ ,  $t(688) = 3.891$ ,  $p < .001$ ; however, marijuana use frequency remained marginally related to severity of sexual aggression ( $\pi_{1j} = 0.058$ ,  $SE = 0.032$ ,  $t(688) = 1.796$ ,  $p = .072$ ), providing support for the second hypothesis at the within person level.<sup>8</sup>

Second, analyses were conducted to measure between-group differences in sexual aggression severity associated with frequency of drug use at each point in time. This was accomplished by conducting a second analysis using an intercepts and slopes as outcomes model (full model) with level of sexual aggression as the outcome variable and distal marijuana and alcohol use as Level 1 predictor variables. The first levels of the analyses were identical; however, the second analysis included aggregate variables of distal marijuana and alcohol use added to the intercept at Level 2. Together, these models allowed the assessment of compositional effects within the data. In this case, a compositional effect is the degree to which within-person and between-person relationships between sexual aggression and distal drug use differ. The intercept was nonsignificant in this analysis ( $\pi_{0j} = -0.033$ ,  $SE = 0.128$ ,  $t(686) = 0.262$ ,  $p = .794$ ). The decrease in significance between intercepts can be attributed to the addition of the distal marijuana use aggregate ( $\pi_{01} = 1.195$ ,  $p < .001$ ), but not the distal alcohol aggregate ( $\pi_{02} = -0.286$ ,  $p = .65$ ), to the model. In other words, this adjustment removed the intercept variance that was once highly associated with the outcome variable, leading to the conclusion that the average distal marijuana use is associated with men engaging in differing severities of sexual aggression at the group

level; men within a given sexual aggression group have relatively similar levels of distal marijuana use.

### *Distal Drug Use and Sexual Aggression: Other Illicit Drugs*

The third hypothesis was tested using models similar to those used to test the second hypothesis. Distal other drug use replaced distal marijuana use in the analyses; the aggregates of distal other drug and alcohol use were added to the second level of one of the analyses. The alcohol use variable was controlled for via group-mean centering. The variance coefficients corresponding to the intercepts and the other drug use variable were modeled as random effects.<sup>9</sup> Overall, analysis of the third hypothesis yielded the same pattern of results as the second hypothesis. The intercept of the first analysis was significant:  $\pi_{0j} = 0.434$ ,  $SE = 0.032$ ,  $t(832) = 13.684$ ,  $p < .001$ . The intercept of the second analysis, however, was nonsignificant,  $\pi_{0j} = -0.088$ ,  $SE = 0.171$ ,  $t(830) = 0.518$ ,  $p = .604$ . The decrease in significance of the intercept can be directly attributed to the addition of the distal other drug use aggregate ( $\pi_{01} = 0.739$ ,  $p = .043$ ), but not the distal alcohol use aggregate ( $\pi_{02} = -0.612$ ,  $p = .348$ ), to the model. As with the second hypothesis, when the drug use aggregate variable is added to the model it accounted for a significant portion of the variance that was previously broadly attributed to the intercept.

In further concordance with the results of our second hypothesis, the first analysis of hypothesis three indicated that distal other drug use was significantly related to sexual aggression severity,  $\pi_{1j} = 0.155$ ,  $SE = 0.054$ ,  $t(832) = 2.864$ ,  $p = .005$ ; the second analysis, however, found distal other drug use to be only marginally related to sexual aggression severity,  $\pi_{1j} = 0.105$ ,  $SE = 0.058$ ,  $t(832) = 1.824$ ,  $p = .068$ , when the compositional effects were assessed.

## DISCUSSION

Results of this study suggest that both proximal and distal drug use play significant roles in men's sexually aggressive behaviors. Specifically, the results of the first analysis suggest that intoxication due to drug use immediately prior to sexual activity is significantly related to severity of sexual aggression during that encounter, after controlling for proximal intoxication due to alcohol use. The results of the second set of analyses suggest that an increased severity of sexual aggression is likely to include an increased frequency of past marijuana use, but not other drug use, after controlling for distal alcohol use. These analyses indicate that the relationship between sexual aggression and marijuana use is stronger when measured between the groups of sexually aggressive men than when measured within each man. After accounting for the intergroup effects, however, within-person effects remained marginally significant ( $p = .07$ ); this indicates that although the data are best modeled using between-person effects, within-person variables continue to account for a portion of the variance and should remain in the model.

In agreement with previous research on the topic, the analyses also suggest that, on average, the severity of men's sexual aggression steadily decreased from adolescence through 4 years of college. Coefficients associated with intoxication due to drug and alcohol use at the time of the sexual aggression, however, greatly outweighed the coefficient associated with time. When situational substance use is considered, within-person trajectories become positive across time points. The coefficients suggest that situational substance use is a stronger indicator of level of sexual aggression than year in college and thus nullify the negative trend of sexual aggression severity across time.

Although proximal drug use levels predict sexual aggression severity, this does not necessarily indicate that it is the pharmacological effects of drugs that lead to sexually aggressive behavior. The recreational use of these drugs is illegal in the United States; thus, situations that include drug use are considered deviant in that respect. These situations involve individuals willing to break the law (by using illegal drugs) and often lack the oversight of legitimate authority figures—such as parents; only 11% of parents surveyed by Williams and colleagues were aware of their teens' illicit drug use (Williams, McDermitt, Bertrand, & Davis, 2003). It is possible that deviant settings conducive to substance use may also be conducive to male-to-female violence (Kilpatrick et al., 1997; Martino, Collins, & Ellickson, 2005).

### *Explanations of Findings*

There are several plausible explanations for the relationship that was found between sexual aggression and drug use. First, as previously stated, the pharmacological effects of drugs may lead a man to become sexually aggressive. This explanation is supported by the relationship, illustrated in the present research, between situational drug use and sexual aggression; men who experience increasing effects of drugs are likely to display increasing levels of sexual aggression. This pharmacological explanation is also somewhat supported by the relationships between distal drug use and sexual aggression; the effects associated with an increased frequency of drug use may lead men to display increased levels of sexual aggression. There are countless men, however, who use drugs but show no sexually aggressive behavior. This makes an assertion of a causal link between the pharmacological effects of drug use and sexual aggression tenuous at best.

Second, men may use drugs to overcome their personal inhibitions against sexually aggressive behavior. In this explanation, sexually aggressive men use drugs as a mechanism to decrease perceived responsibility for their behaviors. This mechanistic view has been suggested in the literature on alcohol use and sexual assault (Abbey et al., 1996). This explanation is supported by the link between proximal drug use and sexual aggression in that the perpetrators may use drugs shortly before the sexually aggressive encounter to experience the disinhibiting effects of the “high” before and during the encounter.

Third, sexual aggression may lead to drug use as a method to cope with the guilt and resulting depression associated with the transgression (Giannini & Fellows, 1986). It is possible that the sexual aggression occurred first and that drug use resulted as a coping mechanism. The significant relationship found in the present research between proximal drug use and sexual aggression casts doubt on this third explanation. In this case, it is clear that the drug use occurred before (or possibly during) the sexually aggressive encounter. This ordering goes against the rationalization that sexual aggression leads to drug use.

Fourth, drug use and sexual aggression may co-occur in men who lead a generally deviant lifestyle; that is, a deviant lifestyle mediates the relationship between drug use and sexual aggression. This explanation is supported by the relationship between proximal drug use and sexual aggression; it is quite conceivable that men engage in multiple deviant behaviors simultaneously. The U.S. Department of Justice (2005) reported that 47% of those incarcerated for violent crimes in 2002 had been using drugs or alcohol at the time of the offense.

Furthermore, 67% of violent offenders reported symptoms meeting criteria for substance use dependence in the year before their incarceration. It is not a stretch to assume that men who perpetrate sexual aggression follow the same pattern. This explanation is also strongly supported by the relationships found in the present research between distal drug use and sexual aggression. These findings suggest that increased levels of marijuana and other illicit drug use are predictive of increased sexual aggression severity. The mere disposition toward using drugs at increasing levels may indicate a level of deviance that can predict levels of sexual aggression.

In this vein, there may be other variables that mediate the relationship between drug use and sexual aggression aside from a generally deviant lifestyle. There may be other contextual factors that mediate this relationship—such as family- or community-related dynamics. There may also be psychological or mental health variables that predispose a man to both use drugs and display sexually aggressive behavior. Although the current study has extended prior research by examining the relationship between drug use and sexual perpetration, it still fails to illuminate the specific pathway this relationship takes. All of the pathways described above are possibilities that need to be explored in future research.

### *Limitations*

Notwithstanding the longitudinal nature of the data, there are still concerns associated with this research. First, data for this study, although collected from men themselves rather than their partners or victims, were based on self-report. Self-report data concerning substance use (marijuana and alcohol) have been found reliable (Mensch & Kandel, 1988; O'Malley, Bachman, & Johnston, 1983), but participants may have answered the substance use questions dishonestly. Secondary data analysis strategies were based on data collected for a study not originally designed to test the hypotheses related to drug use, alcohol use, and sexual aggression. Furthermore, although the percentage of men reporting sexually aggressive behaviors across time in this study (31.1%) coincides with previously published rates (Koss et al., 1987), it is possible that these behaviors were underreported. Only 23% of the participants from the initial sample completed the fifth and final time point of the project. Although attrition is inevitable and to be expected in longitudinal designs, it does present difficulties in interpreting and generalizing data collected across time. Because attrition was not systematically related to any of our variables of interest, we do not believe that it had an impact on the outcomes of our analyses or our interpretations.

Although the questions concerning proximal substance use in relation to sexual activity teased apart the effects of drugs and alcohol, they did not tease apart relationships between specific drugs (e.g., marijuana, cocaine, methamphetamine). The questions concerning distal substance use separated the effects of alcohol, marijuana, and other drug use. In this case, it would also be helpful to further separate the effects of specific drugs. In both cases, extremely large samples would be needed due to low base rates of non-marijuana illicit drug use within college populations, as indicated by data used in these analyses. Furthermore, the questions used to assess substance use did not constitute an accepted instrument with known psychometric properties. Although we have no reason to question the validity of our substance use data, using accepted measures of substance use generally provides more information.

A paper that presents analyses parallel to those presented in this article (by using alcohol use to predict sexual aggression while controlling for drug use) would be a worthwhile addition to the literature on substance use and sexual aggression. We deemed analyses focused on alcohol use to be outside the scope of the current research. We want the focus and interpretations of this article to be centered on the relationship between drug use and sexual aggression.

Finally, data for this study were collected at five time points over 4 years. There were 7 months between the first and second time points and 1 year between each of the subsequent time points. Although this does not affect the interpretation of the relationship between proximal substance use and sexual aggression, it limits the interpretation of the relationship between distal substance use and sexual aggression. More specifically, it is not possible to distinguish which behavior came first, the sexual aggression or the substance use.

## CONCLUSIONS

This study has established strong links between both distal and proximal drug use and sexually aggressive behaviors, while controlling for the effects of alcohol use. The statistical strategy employed allowed the outcome variable to be predicted by multiple variables at the within-person level over time. This, in essence, collapsed the data into separate trajectories for each man to assess the nature of the relationships. In testing the first hypothesis, individual trajectories suggest that a man's level of proximal intoxication due to drug use is highly predictive of his severity of sexual aggression within a sexual encounter. In testing the second hypothesis, men's trajectories suggest that distal marijuana use is highly related to sexually aggressive behavior. Furthermore, when compositional effects are assessed, men's trajectories are altered by the differences among the average distal marijuana use levels defined by severity of sexual aggression. This indicates that broad between-person differences in marijuana use predict sexual aggression severity better than within-person differences. In testing the third hypothesis, distal other illicit drug use predicts sexual aggression severity.

The results of this study support the assertions that specific situations and lifestyles that involve increasing levels of drug use also tend to include increasing levels of sexual aggression in males. The results of this research have implications for a variety of professionals who work in applied settings. The strong relationship between drug use and sexual aggression suggests that a sexual violence awareness component should be added to substance abuse treatment programs. Inversely, professionals counseling men with a history of sexual violence may choose to focus on substance use issues during the treatment process. College administrators should consider including information concerning sexual aggression into prospective or existing social norms campaigns targeted at changing college students' perceived norms of drug and alcohol use.

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## DECLARATION OF CONFLICTING INTERESTS

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## NOTES

<sup>1</sup>Participants who endorsed this response during the first time point were excluded from the subsample; this was to allow for more clear interpretations of the intercepts at the first time point within each model.

<sup>2</sup>A test for a quadratic relationship between sexual aggression levels and time proved nonsignificant, indicating participants' trajectories of sexual aggression across time are linear.

<sup>3</sup>Reports of male and female proximal substance use were highly correlated at all five time points ( $p < .001$ ).

<sup>4</sup>The variance coefficients corresponding to time ( $u_{1j} = .027, p > .500$ ) and proximal alcohol use ( $u_{3j} = .162, p = .113$ ) were nonsignificant; they were, therefore, modeled as fixed effects.

<sup>5</sup>Although the variance associated with proximal alcohol use was controlled for in the analysis, it also significantly predicted sexual aggression,  $\pi_{3j} = 0.219, SE = 0.046, t(1226) = 4.803, p < .001$ .

<sup>6</sup>Correlations between distal alcohol, marijuana, and other drug use within time points were statistically significant and relatively consistent across time points. Across time, a great majority of participants who reported some level of drug use also reported some level of alcohol use (i.e., marijuana: >97%, other illicit drugs: >99%). Correlations between the three measures of substance use are significant at  $p < .05$  at all five time points. The correlations between distal marijuana and alcohol use range from  $r = .33$  to  $.50$ ; the correlations between distal marijuana and other drug use range from  $r = .55$  to  $.64$ ; and the correlations between distal alcohol and other drug use range from  $r = .13$  to  $.28$ .

<sup>7</sup>The variance coefficient associated with distal alcohol use was nonsignificant ( $u_{2j} = .046, p = .068$ ), so the variable was entered into the model as a fixed effect.

<sup>8</sup>Although the variance associated with distal alcohol use was controlled for in these analyses, it was found to be a significant negative predictor of level of sexual aggression (Analysis 1:  $\pi_{2j} = -0.053, p < .015$ ; Analysis 2:  $\pi_{2j} = -0.072, p < .01$ ).

<sup>9</sup>The variance coefficient corresponding to distal alcohol use, although significant ( $u_{2j} = .042, p = .009$ ), was modeled as a fixed effect to increase the reliability estimates of the intercept and distal other drug use. A deviance test revealed that the amount of variance lost from the model was nonsignificant.

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