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ALCOHOL-INVOLVED RAPES: ARE THEY MORE VIOLENT?

Antonia Abbey,

Department of Community Medicine, Wayne State University

A. Monique Clinton,

Department of Community Medicine and Department of Psychology, Wayne State University

Pam McAuslan,

Department of Behavioral Sciences, University of Michigan-Dearborn

Tina Zawacki, and

Department of Community Medicine and Department of Psychology, Wayne State University

Philip O. Buck

Department of Community Medicine and Department of Psychology, Wayne State University

Abstract

Alcohol's psychological, cognitive, and motor effects contribute to rape. Based on theory and past research, we hypothesized that there would be a curvilinear relationship between the quantity of alcohol consumed by perpetrators and how aggressively they behaved. Moderate levels of intoxication encourage aggressiveness; however, extreme levels severely inhibit cognitive and motor capacity. We also hypothesized that victims' alcohol consumption would have a curvilinear relationship to their resistance. These hypotheses were examined with data from 132 college women who had been the victims of attempted or completed rape. Although there was a curvilinear result for perpetrators, the slope of the curve suggested that aggressiveness was worst when no alcohol or the highest levels of alcohol were consumed. There was a negative linear relationship between victims' alcohol consumption and resistance. Difficulties associated with accurately assessing degree of intoxication from survey data are discussed and suggestions are made for improving alcohol measurement in rape research.

Approximately half of college students' sexual assaults are associated with alcohol use and rates of alcohol consumption are typically higher for rapes than for other types of sexual assault (Abbey, McAuslan, & Ross, 1998; Abbey, Ross, McDuffie, & McAuslan, 1996a; Copenhaver & Grauerholz, 1991; Harrington & Leitenberg, 1994; Koss, 1988; Muehlenhard & Linton, 1987; Ullman, Karabatsos, & Koss, 1999a; 1999b). In most alcohol-involved sexual assaults, both the perpetrator and the victim have consumed alcohol. Sexual assaults usually occur in the context of social interactions such as dates and parties, where shared alcohol consumption is the norm (Abbey et al., 1996a; Ullman et al., 1999b).

A serious limitation of most research designed to examine alcohol's role in sexual assault is that alcohol consumption has been treated as a dichotomous variable. Only whether or not the perpetrator and/or the victim consumed alcohol is assessed; the quantity of alcohol consumed is not evaluated. This approach leaves many important questions unanswered such as how does the quantity of alcohol consumed by the perpetrator affect how aggressively he behaves and how does the quantity of alcohol consumed by the victim affect how much she resists? The study described in this paper attempts to address these questions and others with information provided by college student victims of attempted and completed rape. Victims' reports of the quantity of alcohol consumed by themselves and their perpetrators are used to predict cross-sectionally the amount of aggression, resistance, and injuries associated with the rape. Past research has also linked characteristics of the rape situation, such as the relationship between the victim and perpetrator and the locations in which they spent time together, with alcohol consumption. These variables were also examined in this study. The relevant literature is reviewed below and then the study's hypotheses are described.

Review of Research That Examines Alcohol's Effects

Alcohol has psychological, cognitive, and motor effects that influence aggressive and sexual behavior and contribute to sexual assault. Alcohol is commonly thought to enhance sexual behavior and aggressiveness, particularly in men (Abbey, McAuslan, Ross, & Zawacki, 1999; Brown, Goldman, Inn, & Anderson, 1980). Thus, when drinking, some men are predisposed to act both sexually and aggressively. Alcohol consumption also impairs cognitive and motor skills (Hindmarch, Kerr, & Sherwood, 1991; Peterson, Rothfleisch, Zelazo, & Pihl, 1990). Alcohol reduces people's ability to engage in complex, higher order cognitive processes, such as abstraction, conceptualization, planning, and problem-solving (Hindmarch et al., 1991; Leonard, 1989; Peterson et al., 1990; Tranel, Anderson, & Benton, 1994). When intoxicated, people tend to focus on the most salient cues in a situation and ignore more peripheral information (Steele & Josephs, 1990; Taylor & Leonard, 1983). Thus, it has been hypothesized that alcohol myopia makes it easier for some men to commit sexual assault because it allows them to focus on their immediate feelings of sexual arousal and entitlement rather than on more distal cues such as the woman's discomfort or the potential for later punishment (Abbey, Zawacki, Buck, Clinton, & McAuslan, 2001). In laboratory studies in which willingness to shock another person is used to measure aggression, intoxicated men retaliate strongly if they feel threatened and once they begin to act aggressively, it is difficult to make them stop unless nonviolent cues are highly salient (Taylor & Chermack, 1993). In these studies, the dose of alcohol is typically positively related to levels of aggression. Laboratory studies are restricted for both ethical and practical reasons as to how intoxicated they can make participants, thus they do not include extremely high levels of intoxication. The highest blood alcohol level (BAL) in these studies is typically .10, which is comparable to drinking about five standard drinks within one hour (Ito, Miller, & Pollock, 1996).

In natural drinking settings, people often reach much higher levels of intoxication. Extreme levels of intoxication (above a BAL of about .20) are associated with severely restricted motor skills (Schuckit, 1995). When motor impairments are severe, men are likely to

become clumsy and ungainly and less able to engage in behaviors that require thought and a coordinated response, including aggression (Giancola, in press; Pernanen, 1993). This suggests that there may be a curvilinear relationship between perpetrators' alcohol consumption and their aggressiveness. At low and moderate levels of consumption, alcohol's psychological and cognitive effects are hypothesized to encourage men to use greater force, which in turn leads to greater victim resistance and injuries (Ullman, 1997). At high levels of consumption, however, alcohol-induced cognitive and motor impairments may be so severe that men cannot effectively act on their desires. Thus, levels of aggression diminish. Additionally, at extremely high levels of intoxication, men are often unable to maintain an erection, and therefore, they may be unable to complete a rape (Crowe & George, 1989; George & Norris, 1991; Wilsnack, Plaud, Wilsnack, & Klassen, 1997).

Alcohol produces the same cognitive impairments in women as in men; thus, intoxicated women also focus on the most salient cues in the situation. Sexual assaults typically occur in the context of social interactions such as dates or parties (Koss, 1988). Most women are unlikely to be on the lookout for sexual assault in these settings. Instead, they are focused on having fun and deciding how involved they want to be with their male companion. Norris, Nurius, and Dimeff (1996) describe how women need to walk a "cognitive tight rope" (p. 137) at parties and on dates, balancing their desire to relax and have fun with safety concerns. It is likely that social needs are typically more salient than safety concerns in these contexts (Nurius & Norris, 1996). Thus, a drinking woman is likely to attend to cues that pertain to how much she is enjoying herself or how pleased she is that this man is showing an interest in her, rather than cues such as he's touching her more than she would like or he's making a lot of sexual jokes. Testa and Livingston (1999) interviewed sexual assault victims, half of whom were college students. Women who were drinking reported that their intoxication made them take risks that they normally would avoid, such as riding home from a party with a man they did not know well. These women thought that alcohol made them feel comfortable in situations that they normally would view as dangerous. Parks and Miller (1997) found that women were frequently sexually victimized in bars or by men they had met in a bar. These women reported that heavy drinking made them less aware of men's threatening behavior.

The studies described above explain how alcohol consumption leads some women to initially ignore aspects of the man's behavior that they might have focused on if sober. The fact that women may have missed signs of a man's impending aggressiveness does not diminish the man's responsibility for his actions. Once the situation has escalated to the point that a woman realizes that a man is trying to force sex on her, alcohol is likely to have additional effects on her behavior. Alcohol's effects are likely to vary depending on the level of intoxication. As for the perpetrator, a curvilinear relationship is posited for the victim, with mild to moderate levels of alcohol consumption making women engage in greater levels of resistance. This is based on the premise that once a man's intentions are clear, a woman's immediate fear and pain will be more salient to her than long-term concerns such as whether her resistance will hurt the man's feelings or harm their relationship. At high levels of intoxication, however, it is unlikely that the woman has the cognitive or physical capacity to engage in much resistance.

Evidence Regarding Alcohol's Effects on Sexual Assault Severity

Findings regarding the relationship between alcohol consumption and sexual assault severity are mixed. Ullman et al. (1999a; 1999b) published two studies that reanalyzed data from Koss, Gidycz, and Wisniewski's (1987) nationally representative sample of college students. One study used men's reports (Ullman et al., 1999a) and the other used women's reports (Ullman et al., 1999b). In both studies, they evaluated a path model that examined relationships between perpetrators' and victims' alcohol consumption during the assault, perpetrators' aggression, victims' resistance, and severity of the assault (ranging from sexual contact to completed rape). Alcohol consumption was assessed only as to whether or not it occurred, not the quantity consumed. They hypothesized that perpetrators' alcohol consumption would be positively related to their level of aggressiveness and victims' alcohol consumption would be negatively related to perpetrators' aggressiveness. That is, drinking men would be more aggressive than nondrinking men and drinking women would engender less aggressiveness than would nondrinking women. Perpetrators' aggressiveness was hypothesized to be positively related to how much victims resisted, which in turn, was hypothesized to be positively related to severity of the assault.

The men's data (Ullman et al., 1999a) did not support all their hypotheses. Contrary to prediction, the victims' alcohol consumption during the assault was positively related to how aggressive the perpetrator was during the assault and perpetrators' alcohol consumption was not significantly related to their aggressiveness. As hypothesized, perpetrators' aggressiveness was positively related to how much victims resisted, which was positively related to severity of the assault. The women's data (Ullman et al., 1999b) supported their original hypotheses. Victims' alcohol consumption was negatively related to perpetrators' aggressiveness and perpetrators' alcohol consumption was positively related to their aggressiveness. As found in the men's data set, perpetrators' aggressiveness was positively related to victims' resistance, which in turn was positively related to the severity of the assault. It is difficult to reconcile the different findings for these two studies. In most sexual assaults, victims' and perpetrators' alcohol consumption are highly correlated (Abbey et al., 1998; Muehlenhard & Linton, 1987). This makes it unlikely that they will relate to the same outcome variables in opposite directions or that both will be significant predictors in a multivariate analysis. Although the correlation between perpetrators' and victims' alcohol consumption was very high in both of Ullman et al.'s (1999a; 1999b) studies, it was somewhat lower in the woman's data set. This may at least partially explain the different findings for the two studies. The study described in this paper was intended to replicate and extend Ullman et al.'s (1999a; 1999b) findings. We extended their study by including ordinal measures of alcohol consumption so that hypotheses about quantity could be examined and by including a measure of injuries.

Other researchers have also examined the relationship between alcohol consumption and sexual assault outcomes. Martin and Bachman (1998) studied a representative sample of community rape victims. Participants were not asked to report on their own alcohol consumption; however, they indicated whether or not their perpetrator had consumed alcohol. They found that rapes were less likely to be completed when perpetrators drank alcohol and when victims resisted. However, victims were more likely to be injured when

perpetrators drank alcohol. In community samples, Ullman and Brecklin (2000) also found that perpetrators who consumed alcohol caused more injuries than did non-drinking perpetrators, although Brecklin and Ullman (2001) did not find this relationship.

Several researchers have found that completed rapes are more common among intoxicated victims suggesting that sober victims are more able to find a way to escape or effectively resist (Abbey, Ross, McDuffie, & McAuslan, 1996b; Harrington & Leitenberg, 1994; Ullman & Knight, 1993). For example, Harrington and Leitenberg (1994) found that acquaintance rape victims who reported being at least somewhat drunk were less likely to use physical resistance strategies than were victims who were not drunk, although neither the type of force used by the perpetrator nor the type of sex that was forced varied with alcohol consumption.

Situational Factors Associated With Alcohol-Involved Sexual Assaults

Several other characteristics of sexual assault have been linked to alcohol consumption. In alcohol-involved sexual assaults, as compared to those in which no alcohol was consumed, the perpetrator and victim are more likely to be casual acquaintances or casual dates rather than in a steady relationship (Abbey et al., 1996a; Harrington & Leitenberg, 1994; Ullman et al., 1999a; 1999b). Not surprisingly, these same studies have also found that alcohol-involved sexual assaults are more likely to involve time spent at a party or bar. Perpetrators' and victims' usual alcohol consumption are positively related to their alcohol consumption during the assault (Abbey et al., 1998; Ullman et al., 1999a; 1999b).

Summary of Hypotheses

The mixed results found in past research regarding the relationship between alcohol consumption and indicators of sexual assault severity may be due to these studies' limited measures of alcohol use. In the study described in this paper, the quantity of alcohol consumed during the interaction was measured. Women reported on their own alcohol consumption and the perpetrator's alcohol consumption. Women may not always know how much alcohol the perpetrator consumed; however, they were usually together in a social interaction before the assault. This suggests that in most cases the woman was able to observe the man's drinking and provide a reasonable estimate. Analyses were restricted to women who experienced attempted or completed rape, both because these are crimes in all states and because they are most likely to involve physical aggression and injuries (Koss, 1988; 1993).

First, it was hypothesized that both perpetrators' and victims' alcohol consumption would be related to whether the rape was completed or not. At high levels of consumption, men may be unable to complete a rape because of alcohol's effects on their cognitive and motor skills. At high levels of consumption women may be unable to resist effectively, thus they would be more likely to experience completed rather than attempted rape. Second, it was hypothesized that there would be a curvilinear relationship between alcohol consumption and the severity of the assault, with severity operationalized as the perpetrator's aggressiveness and the victim's resistance and injuries. Up to a certain point, the perpetrator's increased intoxication should be related to increased aggressiveness. The

cognitive impairments induced by alcohol should make it easier for a perpetrator to focus on his own needs (e.g., his sexual desire, sense of entitlement) and to ignore the woman's signs of distress. At extremely high levels of intoxication, however, alcohol's effects on motor skills are expected to reduce perpetrators' capacity for action so that levels of aggressiveness decline. Like other authors (Harrington & Leitenberg, 1994; Martin & Bachman, 1998; Ullman et al., 1999a; 1999b), we hypothesized that the more aggressively the perpetrator behaved, the more the victim would resist, and therefore, the more injuries she would sustain. The woman's alcohol consumption was also hypothesized to have curvilinear effects so that resistance would increase with moderate levels of intoxication, but it would diminish at high levels of intoxication. Third, the woman's alcohol consumption during the assault was expected to be positively related to her usual alcohol consumption, knowing the perpetrator only casually, and spending time with the perpetrator at a party or a bar.

METHOD

Participants

Participants were 132 female undergraduates at a large, urban, commuter university. These individuals were part of a larger study, with participation in the current study restricted to those women who had experienced attempted or completed rape since the age of 14. Participants ranged in age from 18 to 45 years, with a mean age of 23 years. Forty-eight percent ($n = 63$) of the participants were Caucasian, 43% ($n = 57$) were African American, 3% ($n = 4$) were Arabic or Middle Eastern, 3% ($n = 4$) were Hispanic, 1% ($n = 2$) were Native American, 1% ($n = 1$) were Asian or Pacific Islander, and the remaining 1% ($n = 1$) were either another ethnicity or did not answer the question. Two-thirds of participants were employed at least part-time. Twenty-six percent of participants' mothers and 33% of their fathers had completed college. The demographic characteristics of these women were comparable to those of the full sample.

Procedures

Participants were recruited through advertisements in the student newspaper, fliers distributed on campus, and announcements made in classrooms about a study of dating experiences. The distribution of majors represented the university's undergraduate enrollment for women reasonably well: 30% psychology, 12% pharmacy and allied health, 12% business, 11% science, 9% education, 8% liberal arts, 5% nursing, 5% social work, 3% fine arts, 1% engineering, and the remaining 4% had a different major or did not answer the question.

A female research assistant contacted potential participants by telephone and told them that the study concerned the dating experiences of college students. Due to the larger purposes of the study, participants were required to have dated a man in the last year, not to be married or engaged, and to have lived in the United States at least 10 years. Eligible participants were run in small groups of three to five women. Participants were asked to sit far apart so that no one could see their answers. The female experimenter reviewed the consent form with participants and then they completed the questionnaire on their own. After participants finished, they placed their questionnaire in an envelope, sealed it, returned it to the

experimenter, and were paid \$10 or given course extra credit. No names or identifying information were included on questionnaires.

Measures

Sexual assault experiences—Sexual assault experiences were measured with a modified 12-item version of the Sexual Experiences Survey (SES; Koss et al., 1987). Two modifications were made. First, in addition to the 10 items included in the 1987 version of the SES, two items were added that assessed sexual intercourse when consent could not be given (because the victim was too intoxicated by alcohol or drugs or unconscious; Abbey et al., 1998) and labeling the experience as rape (Koss & Oros, 1982). The second modification concerned the instructions, which emphasized that these experiences could occur as a part of a variety of social interactions including dates, parties, or casual get-togethers with friends. Past research suggests that women do not always label experiences with dates or friends as sexual assault (Koss, 1988), thus these examples were included to insure that they were thinking of these possibilities as they answered the questions. This measure has been used extensively and has good internal consistency and test-retest reliability (Koss et al., 1987). Cronbach coefficient alpha in the present study was .84.

The questions in the SES are ordered such that they increase in severity. Women were instructed to answer a series of questions about their most severe sexual assault experience. If this type of sexual assault happened more than once, they were asked to think about their worst experience. Most of the questions were close-ended, although participants were asked at the end of this section of the survey to provide any additional information that they thought would help explain what happened. The following information about the worst sexual assault experience was analyzed.

Age—Participants were asked how long ago the sexual assault occurred, their age at the time, and the perpetrator's age at the time.

Relationship—The relationship between the woman and the perpetrator was assessed with two questions. In the first question, participants described their relationship using the categories: no relationship, acquaintance, friend, coworker, casual date, steady date, or other. In the second question, participants were asked how well they knew the man at the time of the interaction on a 7-point scale with options ranging from *not at all well* to *extremely well*.

Location and time spent together—The places where the participant spent time with the perpetrator were assessed. Participants were given a list of locations (e.g., his house, her house, a party, a restaurant) and asked to check all that they were at with the man during the interaction. They were also asked how much time they spent together on this occasion.

Alcohol consumption—Participants were asked two separate questions regarding how much alcohol they consumed prior to and during the interaction. These two items were combined. Participants' scores ranged from zero to 20 drinks. A drink was defined as 12 ounces of beer, 4 ounces of wine, a 10-ounce wine cooler, or one ounce of liquor. Responses were extremely skewed; thus they were winsorized by collapsing the high end of the scale

(Winer, 1971). An 8-point scale was developed with scores ranging from zero drinks to seven or more drinks.

A parallel measure was formed that assessed the man's alcohol consumption during the interaction. As is typically found in research with college students, men's alcohol consumption was higher than women's (Prendergast, 1994). Scores ranged from zero to 31 drinks. This measure was also skewed, thus it was recoded and winsorized allowing for an 8-point scale. To preserve the greater variability in men's drinking, perpetrators were coded as having consumed: zero drinks, 1–2 drinks, 3–4 drinks, 5–6 drinks, 7–8 drinks, 9–10 drinks, 11–12 drinks, or 13 or more drinks.

Participants' usual alcohol consumption was also assessed at the point in their lives that the sexual assault occurred. Women were asked the approximate number of days they drank in the month prior to the sexual assault. Responses ranged from zero to 14 days.

Perpetrators' aggressiveness—Participants were asked to rate the extent to which the perpetrator used three different tactics to obtain sex. The tactics were verbal pressure, threats of physical force, and use of physical force. Each tactic was assessed on a 5-point scale with options ranging from *not at all* to *very much*. These responses were combined into a single measure with a Cronbach coefficient's alpha of .71.

Resistance—The extent to which the woman resisted was assessed with six items that included verbal strategies (e.g., saying "no," trying to reason with him) and physical strategies (e.g., pushing him away; punching, hitting, or kicking). Responses were made on 5-point scales with options ranging from *not at all* to *very much*. These responses were combined and alpha was .87.

Injuries—The woman's injuries were assessed with a single question. The extent to which she was physically injured was rated on a 5-point scale with options ranging from *not at all injured* to *very much injured*. Most women did not experience extreme injuries; therefore, the top two categories were combined, reducing this to a 4-point scale.

RESULTS

Descriptive information about these women's rape experiences is displayed in Table 1. As can be seen from the table, the rapes that these women described occurred, on average, four years earlier. All of the women knew the perpetrator; the most common relationship between the woman and man was a casual date, with the woman feeling that she knew the man somewhat well. The three most common locations where at least part of this interaction occurred were the man's home, a party or bar, and the woman's home. The total length of the interaction averaged six hours. Fifty-five percent of the perpetrators and 40% of the women consumed some alcohol prior to or during the interaction. On average, levels of perpetrators' aggressiveness, victims' resistance, and victims' injuries were moderate.

The Relationship Between Alcohol Consumption and Whether or Not the Rape Was Completed

The first hypothesis concerns the relationship between alcohol consumption and rape completion. Perpetrators who consumed a large quantity of alcohol maybe unable to complete a rape because of alcohol's effects on their cognitive and motor skills. Most participants experienced completed rape (20 attempted rapes and 112 completed rapes); thus, only univariate analyses could be conducted to test this hypothesis. An analysis of variance (ANOVA) was conducted in which the independent variable was whether or not the rape was completed and the dependent variable was the quantity of alcohol the perpetrator consumed. The difference in the number of drinks consumed by perpetrators of attempted and completed rape did not significantly differ, $F(1, 130) = .801, p > .37$; M 's = 2.50 versus 3.06; SD 's = 2.11 versus 2.40. Thus, this hypothesis was not confirmed.

It was also hypothesized that women who consumed a large quantity of alcohol would be more likely to experience completed rather than attempted rape because they would be unable to resist effectively. To test this hypothesis, an ANOVA was conducted in which the independent variable was whether or not the rape was completed and the dependent variable was the quantity of alcohol the victim consumed. The difference in the number of drinks consumed by victims of attempted and completed rape significantly differed, $F(1, 130) = 5.36, p < .02$; M 's = 1.60 versus 3.08; SD 's = 1.60 versus 2.77. As hypothesized, women consumed more alcohol in completed rapes than in attempted rapes.

The Linear and Curvilinear Effects of Alcohol Consumption

Cohen's and Cohen's (1975) approach to testing for significant curvilinear effects was used. First, a regression analysis was conducted in which the standard linear alcohol consumption term was included. Then, a second regression analysis was conducted which included both the linear and quadratic terms; alcohol consumption and alcohol consumption squared were both included as predictors. The change in R^2 between the two equations was used to evaluate whether or not the quadratic term was needed to explain the relationship between alcohol consumption and the outcome measures. Three different sets of regression analyses were conducted to examine three different severity outcomes: perpetrators' aggressiveness, victims' resistance, and victims' injuries. The top half of Table 2 shows the results when perpetrators' alcohol consumption was used to predict the outcome measures; the bottom half of Table 2 shows the results when victims' alcohol consumption was used to predict these same outcome measures.

As can be seen in the top half of Table 2, there was support for the curvilinear hypothesis with perpetrators' alcohol consumption. For perpetrators' aggressiveness, victims' resistance, and victims' injuries, there was an increase in R^2 that ranged from .02 to .05 when the quadratic term was added to the regression equation. Cohen's and Cohen's (1975) formula to test the significance of a change in R^2 was used to determine if these increases were significant. Although the amount of variance explained was relatively small, the addition of the quadratic component produced a marginally significant increase in R^2 for perpetrators' aggressiveness ($p < .08$), and significant increases in R^2 for victims' resistance and injuries (p 's $< .05$).

SPSS Version 8 was used to draw the best-fitting line through the datapoints so that the form of the curvilinear effect could be examined. The relationship between the perpetrators' alcohol consumption and all three dependent measures was mildly U-shaped. The amount of aggression, resistance, and injuries declined slightly between when the perpetrator did not drink alcohol and when he drank moderately. As drinking increased from this level, aggression, resistance, and injuries also increased. The shape of the curve was not as hypothesized; we had expected severity to decrease at the highest levels of alcohol consumption.

As can be seen from the bottom half of Table 2, there was no evidence for a curvilinear relationship between women's alcohol consumption and these same dependent variables. Adding the quadratic component did not increase the R^2 for any of the outcome measures. There was a significant negative linear relationship between victims' alcohol consumption and perpetrators' aggressiveness, victims' resistance, and victims' injuries. As victims' alcohol consumption increased, perpetrators' aggressiveness, victims' resistance, and victims' injuries decreased.

Path Model Summarizing Alcohol's Effects

The third set of hypotheses about cross-sectional predictors of alcohol consumption during the rape was integrated into a path model that was based on the analyses described by Ullman et al. (1999a; 1999b). Path analysis involves a series of multiple regression analyses, where a dependent variable at one step becomes an independent variable at a later step (Kenny, 1979). Like structural equation modeling, it tests intervening paths. Unlike structural equation modeling, path analysis does not require a large sample size, does not assess latent concepts, and examines each dependent variable sequentially. Figure 1 depicts the results of the path analysis. It is similar to Ullman et al.'s (1999a; 1999b) models in that the first set of equations examines predictors of perpetrators' and victims' alcohol consumption during the incident; the second set examines the effects of these variables on perpetrators' aggressiveness, and the third set examines the effects of prior variables on victims' resistance. Our model differs from Ullman et al.'s (1999a; 1999b) in that the final dependent variable in their model is assault severity, as defined by the type of sexual assault experienced (Koss et al., 1987), whereas in our model it is victims' injuries.

An initial multiple regression analysis was completed in which three variables were included as potential predictors of how much alcohol the woman consumed during the incident. These variables were her relationship to the perpetrator (dummy coded as 0 = casual [friend/acquaintance, coworker, and casual date]; 1 = serious [steady date, fiancé, ex-boyfriend]), whether or not any time was spent during the interaction at parties or bars (dummy coded as 0 = no time spent together at parties or bars, 1 = some time spent together at parties or bars), and her usual frequency of alcohol consumption at that point in her life. As can be seen in Figure 1, women who were in a serious relationship with the perpetrator were marginally less likely to drink alcohol during the incident than were women in a more casual relationship. Women who spent time that evening with the perpetrator at a party or a bar were significantly more likely to be drinking alcohol than women who did not. Furthermore,

the more frequently women usually drank at that point in their life, the more alcohol they consumed during the incident.

As has been consistently found in past research, victims' alcohol consumption and perpetrators' alcohol consumption were strongly, positively correlated. There was no a priori reason to assume that causality flowed in one direction, thus the simple bivariate correlation is shown in Figure 1. Both spending time together at a party or bar and the woman's usual alcohol consumption were positively related to the perpetrator's alcohol consumption.

Next, a regression analysis was conducted in which perpetrators' aggressiveness was the dependent variable and type of relationship, time spent at parties or bars, victims' usual alcohol consumption, victims' alcohol consumption during the incident, and perpetrators' alcohol consumption during the incident were the independent variables. The only significant predictor was victims' drinking during the incident (see Figure 1; for ease of presentation only significant and marginally significant betas are shown). The more alcohol victims consumed, the less aggressively perpetrators behaved during the incident. Neither the linear or quadratic form of perpetrators' alcohol consumption was a significant multivariate predictor of aggressiveness or the other severity measures when victims' alcohol consumption was also included.

All the variables previously described were then used to predict victims' resistance during the incident. As can be seen from Figure 1, only perpetrators' aggressiveness was a significant predictor of resistance. The more aggressively perpetrators behaved, the more victims resisted.

For the final step of the model, victims' injuries were predicted by all the variables to the left of it in the model. Perpetrators' aggressiveness and victims' resistance were the only significant predictors. The more aggressively perpetrators acted and the more victims resisted, the more injuries victims received (see Figure 1). The R^2 was .297 for the final regression equation predicting injuries.

DISCUSSION

Are alcohol-involved rapes more violent? The results of this study suggest that it depends on who is doing the drinking and how much they drank. Perpetrators were most violent when they drank extremely heavily or when they were sober. Victims experienced the most violence when they were the least intoxicated.

This study's findings replicate and extend past research. As found in other studies, victims' usual drinking, being in a casual relationship with the perpetrator, and spending time at a party or bar with the perpetrator were positively related to victims' alcohol consumption during the rape (Abbey et al., 1996a; Harrington & Leitenberg, 1994; Ullman et al., 1999a; 1999b). Unlike past research, this study's measure of usual drinking reflected how frequently victims drank at that point in their lives. Other researchers have used victims' current drinking, which may be an outcome of the sexual assault rather than a predictor of it.

Several studies that used a dichotomous measure of alcohol consumption found that completed rapes, as compared to attempted rapes, were more likely to involve victims' alcohol consumption (Abbey et al., 1996b; Harrington & Leitenberg, 1994; Ullman & Knight, 1993). This study extends past research by finding that the quantity of alcohol consumed by the victim was significantly higher in completed as compared to attempted rapes. Contrary to some previous research (Martin & Bachman, 1998), perpetrators' alcohol consumption was not related to whether or not the rape was completed.

The path model examined in this study was based on the work of Ullman and her colleagues (Ullman et al., 1999a; 1999b). Their path model and ours included perpetrators' aggressiveness and victims' resistance as intermediate outcomes. The major difference in the models was that their final outcome was sexual assault severity (based on the most severe type of assault women indicated on the SES), whereas this study focused only on the most severe sexual assaults (attempted and completed rapes) and used victims' injuries as the final outcome measure. As described in the introduction, when both victims' and perpetrators' alcohol consumption were simultaneously considered as predictors of sexual assault outcomes in Ullman et al.'s work, only victims' alcohol consumption was a significant predictor with perpetrators' data (Ullman et al., 1999a). However, both victims' and perpetrators' alcohol consumption were significant predictors with victims' data (Ullman et al., 1999b). Our findings were like Ullman et al.'s (1999b) results for women, in that victims' alcohol consumption was negatively related to perpetrators' aggressiveness. However, Ullman et al. (1999b) also found a positive relationship between perpetrators' alcohol consumption and their aggressiveness, whereas in our multivariate analyses, perpetrators' alcohol consumption was not a significant predictor. Results in this research area are mixed and the reason for conflicting results across studies is not clear. Although our intermediate outcomes were the same (perpetrators' aggressiveness and victims' resistance), the final outcome measure differed between our study and that of Ullman et al. (1999a; 1999b) and this may explain some of the different findings. Additionally, our study's measure of alcohol consumption was very different from that used by Ullman et al., (1999a; 1999b) which is another factor that may explain the differences in our results. The more alcohol women in our study drank, the less aggressively perpetrators acted, presumably because it took less force to achieve their ends with an intoxicated woman. One participant described alcohol's effects on her ability to resist by writing, "[it] made me tired and drunk. All I wanted to do was pass out." The best explanation for why only victims' drinking was related to outcomes in multivariate analyses in this study is the large amount of shared variance between victims' and perpetrators' drinking. When considered on its own, perpetrators' alcohol consumption was related to aggression, resistance, and injuries in this data set.

This study extends past research both by examining the quantity of alcohol consumed and by considering curvilinear effects. Perpetrators' alcohol consumption was curvi-linearly related to outcome measures, such that rape severity was worst when no alcohol was consumed and when the highest levels of alcohol were consumed. Although we had predicted curvilinear effects, our expectation was that aggressiveness would be highest at moderate levels of alcohol consumption. There are several possible explanations for why this hypothesis was not confirmed. The higher levels of aggressiveness among sober

perpetrators may be due to differences in how aggression is used by sober and intoxicated perpetrators. Sober perpetrators may have purposefully used high levels of aggressiveness for instrumental means to intimidate the victim (Cleveland, Koss, & Lyons, 1999; Martin & Bachman, 1998). For example, one woman in our study reported that when she told her sober date that she didn't want to do more than make out, "he said he would just tie me down and do it." Intoxicated perpetrators' aggressiveness may be less well planned, instead being a byproduct of their drinking. One woman described how alcohol affected the man who raped her by writing, "when he drank, he became very, very aggressive and short tempered. Basically he turned into an asshole."

The original hypothesis that severity would diminish at the highest levels of alcohol consumption because perpetrators would be unable to act effectively was not supported. Perhaps perpetrators are usually able to moderate how aggressive they are, using only as much force as is necessary to subdue their victim. At extreme levels of intoxication, however, they may be unable to judge how much force is required and once they begin to behave aggressively, they may feel that they are unable to stop themselves (Taylor & Leonard, 1983). In partial support of this argument, one participant wrote about the extreme force used by her perpetrator, "He was drunk, I was sober. He kicked his friends out of the house ... then put on a 'sex tape' and told me he was ready. I had a broken rib and was bleeding in my vagina from the force of him. "

It is also possible that there were not enough men drinking extremely high levels of alcohol to adequately address the original hypothesis. Thirteen or more drinks, the highest category included, seems like a high level of consumption, however, these men's alcohol tolerance was not evaluated. Thus, it is impossible to judge how intoxicated they felt at this level. Perhaps the men who drank the most were accustomed to drinking even higher quantities, thus their level of impairment was not as high as other men's. Also, the speed at which the drinks were consumed and whether they were consumed with food would influence blood alcohol level. Thirteen drinks consumed over an entire day and evening would not produce the same level of intoxication as 13 drinks consumed within a few hours. Additionally, perpetrators' alcohol consumption was based on women's estimates of how much the man consumed. Most participants knew the man fairly well and were with him for several hours before the rape occurred, thus they were comfortable estimating the man's alcohol consumption. However, women may not have always known if the perpetrator had been drinking earlier that day before they were together or if he was drinking particularly strong drinks (e.g., doubles or mixed drinks that contained several shots of alcohol).

Some of these explanations also apply to the finding that victims' alcohol consumption had linear rather than curvilinear effects. Here too, our original hypothesis may be incorrect or there may not have been enough severely intoxicated victims in this sample to adequately address it. There is also a problem in that the most severely intoxicated victims may have a difficult time accurately reporting how aggressively the perpetrator behaved and how much they resisted. As one woman wrote, "I was completely intoxicated. I have no memory of the event. I only know it happened because of the physical evidence after I was sober and because of the stories I heard he bragged about us having sex."

This study's intriguing results need to be replicated both with larger samples and with perpetrators' own reports of their alcohol consumption. With a larger sample, the distribution of alcohol consumption should also be larger, so the effects of extremely high levels of consumption can be better evaluated. Although it is impossible to determine participants' blood alcohol levels from self-reports, additional questions would allow for a better estimation of degree of intoxication. Questions are needed that evaluate the number of hours over which the participant was drinking, whether food was also consumed, and how the quantity and speed of alcohol consumption on this occasion compared to participants' usual alcohol consumption. Participants' reports of their own perceived intoxication may be helpful because this would take individual differences in tolerance into account.

This study had several limitations. All of the data was collected at one point in time; thus, causality cannot be determined. On average, the rapes which participants described occurred four years earlier. Thus errors in recall are possible, particularly for women who were severely intoxicated. Participants were asked to describe their worst rape, if more than one had occurred. Thus these findings reflect the most serious sexual assaults. This study also had a relatively small sample size and used a college sample. These data were collected at a commuter university, whose students are more diverse in terms of ethnicity, age, and parents' education than are students at most residential colleges. The inclusion of in-depth questions about alcohol consumption in community samples would provide important information about the generalizability of these results. Additionally, including standardized measures of negative psychological outcomes, as well as physical injuries, would enhance the assessment of sexual assault severity.

These findings have important prevention implications. Perpetrators are responsible for their actions, regardless of how their victim behaved, thus college sexual assault prevention programs need to focus on men. Although many sexual assaults do not involve alcohol consumption, men need to know that they may make poor choices when intoxicated and may feel comfortable using a level of physical aggressiveness against a woman that they usually would avoid. Men also need to know that having sex with a woman too intoxicated to consent is rape, even if they have had sexual relations with this woman before.

It is also important that these results are not misunderstood. The more alcohol victims consumed, the less aggressively perpetrators acted and the fewer injuries sustained by victims. No sexual assault or alcohol professional would suggest that women drink more to avoid being harmed during a sexual assault; instead these effects seem to be due to intoxicated victims' inability to resist effectively. One participant explained her limited resistance by writing, "He put me on the ground and was on top of me and used his body to hold mine down. The alcohol made me very weak and disoriented." It is important for women to understand that many perpetrators seek out intoxicated women because they are easy targets (Kanin, 1985) and that they cannot assume that someone they know fairly well will not take advantage of them when provided with the opportunity.

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Fig. 1.

Path analytic model of the relationships between victims' and perpetrators' alcohol consumption and sexual assault severity ($N = 132$). $*p < .09$; $**p < .05$; $***p < .01$. Only significant and marginally significant paths are included. Standardized betas are shown. The relationship between victims' and perpetrators' alcohol consumption is presumed to be bidirectional, thus the correlation between them is included.

Table 1Descriptive Information About Women's Attempted or Completed Rape Experiences ($N = 132$)

<i>Variable</i>	<i>M</i>	<i>SD</i>
Number of Years Since Rape	4.12	4.08
Woman's Age at Time of Rape	18.87	3.93
Perpetrator's Age at Time of Rape	22.59	6.87
Amount of Time Spent Together	5.53	3.84
Perpetrator's Alcohol Consumption	3.84	4.81
Woman's Alcohol Consumption	1.85	2.68
Perpetrator's Aggressiveness ^a	2.75	1.20
Victim's Resistance ^a	3.11	1.16
Victim's Injuries ^b	1.61	.91

Variable	N	%
Type of Relationship		
Friend/ Acquaintance	25	19
Coworker	2	2
Casual Date	53	40
Steady Date	47	35
Fiancé	2	2
Ex-Boyfriend	3	2
How Well the Woman Knew the Perpetrator		
Not Very Well	25	19
Somewhat Well	63	48
Very Well	44	33
Locations of the Interaction ^c		
Woman's Home	32	24
Man's Home	57	43
Restaurant	20	15
Movie Theater	14	11
Party or Bar	38	29
Car or outdoors (includes sporting events)	27	20
Other	3	10

^aPerpetrator's aggressiveness and victim's resistance were rated on 5-point scales ranging from 1 = *not at all* to 5 = *very much*.

^bVictim's injuries were rated on a 4-point scale ranging from 1 = *not at all injured* to 4 = *injured quite a bit*.

^cRespondents could report multiple locations during the interaction. Thus, percentages do not total to 100% and locations do not sum to $N = 132$.

Table 2

Hierarchical Regression Analyses Examining the Linear and Quadratic Effects of Perpetrators' and Victims' Alcohol Consumption ($N = 132$)

Variable	Perpetrators' Aggressiveness			Victims' Resistance			Victims' Injuries		
	B	SEB	R ²	B	SEB	R ²	B	SEB	R ²
Perpetrators' Drinking									
Step 1									
Perpetrators' Alcohol Consumption	-.10	.04	.01	-.20**	.04	.04	-.14	.03	.02
Step 2									
Curvilinear Drinking Term	.64	.02	.03	.98**	.02	.09	.84**	.02	.06
									.04**
Victims' Drinking									
Step 1									
Victims' Alcohol Consumption	-.26***	.04	.07	-.33***	.04	.11	-.23***	.03	.06
Step 2									
Curvilinear Drinking Term	-.05	.02	.07	.10	.02	.11	.43	.02	.06
									.00

* $p < .08$.

** $p < .05$.

*** $p < .01$.