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The Effects of Alcohol Intoxication and Sexual Interest on Men's Sexual Persistence and Hostility in a Dating Simulation

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Abstract

Perpetrators of sexual assault are often intoxicated; however, few experimental studies evaluate alcohol's "in the moment" effects on sexual aggression. This study extends past theory and research by examining the acute effects of alcohol on men's decisions about how to respond to sexual refusals in a dating simulation. Men ($N = 62$) ages 21–29 were randomly assigned to consume alcohol (target breath alcohol level 0.080%) or no alcohol. Participants were encouraged to talk to a simulated woman and act as they would on an actual date. They made choices from a list which included nonsexual and sexual options. The female agent was programmed to engage in some sexual activities but refuse others. Refusals became more intense if participants persisted. Negative binomial regression analysis was used to test a path analytic model. As predicted, participants' self-reported desire to have sex was positively associated with choosing more consensual sexual activities during the simulation (i.e., activities in which the woman willingly engaged). Consensual sexual activities were positively associated with the number of times participants persisted after the woman refused. Alcohol moderated this relationship such that it was stronger for intoxicated men than sober men. The more sexual refusals participants received, the more hostile verbal comments they made to the woman. Contrary to our predictions, this relationship was not moderated by alcohol condition. Because participants had multiple opportunities to escalate their aggression or desist, this paradigm provides new insights into the mechanisms through which intoxication enhances the likelihood of sexual aggression in dating situations.

Keywords

alcohol administration; intoxication; sexual aggression; hostility; sexual interest

Introduction

Alcohol is associated with approximately half of sexual assaults, with estimates ranging from approximately 40% to 75% (Abbey, Wegner, Woerner, Pegram, & Pierce, 2014; Testa, 2002). Surveys conducted with college and community samples of young men consistently

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find that more than 20% report that they have engaged in some type of sexual activity with a woman whom they knew was unwilling or too impaired to consent (Abbey, Jacques-Tiura, & LeBreton, 2011; White & Smith, 2004). Some of these incidents would not meet legal criteria for sexual assault; however, they are considered acts of sexual aggression because these men acknowledge that they engaged in sexual activity despite the woman's lack of consent. These incidents typically occur among individuals who know each other, often in a dating, "hookup", or party context in which the woman may agree to some types of sexual activities but refuse others (Flack et al., 2016).

Findings from Past Alcohol Administration Research

Numerous alcohol administration studies have demonstrated that intoxicated men act more aggressively than do men in placebo or sober control conditions, particularly when they feel provoked (see Bushman & Cooper, 1990 and Ito, Miller, & Pollock, 1996 for reviews). Many of these studies use modified versions of the Taylor Aggression paradigm or the Point Subtraction Aggression paradigm as the experimental analogue, allowing participants to deliver mild electric shocks or noise blasts or take money from a fictional opponent (Giancola & Parrott, 2007; Golomb, Cortez-Perez, Jaworski, Mednick, & Dimsdale, 2007).

In contrast, relatively few studies have examined the acute effects of alcohol on men's sexual aggression proclivity. These studies have compared intoxicated and sober men's responses to sexual aggression scenarios provided in written, audio, or video format (see Abbey et al., 2014; Abbey & Wegner, 2015; and Davis et al., 2014 for reviews); however, they do not provide clear guidance regarding when to expect a main, mediated, or moderated effect of alcohol (Abbey et al., 2014). For instance, some of these studies have found main effects of drink condition on sexually aggressive behavior (Gross, Bennett, Sloan, Marx, & Jeurgens, 2001; Marx, Gross, & Jeurgens, 1997), with intoxicated men waiting longer to decide that a sexually aggressive man should stop than sober men. Other studies have found mediated effects, with alcohol's effects on participants' self-reported likelihood of acting similar to the male character mediated by perceptions of sexual arousal, anger, and feelings of sexual entitlement (Davis et al., 2012; Norris, Davis, George, Martell, & Heiman, 2002). There is also some evidence for alcohol interacting with pre-existing risk factors, with intoxicated men who have high scores on various risk factors reporting the highest likelihood of being sexually aggressive in a similar situation (Noel, Maisto, Johnson, & Jackson, 2009; Norris et al., 2002). These researchers utilized stimulus materials and outcome measures which varied on numerous dimensions (e.g., whether the scenario ends ambiguously or with forced rape, background information provided about the man and woman). Many of these paradigms only assess outcomes once, after the full scenario is presented (see Bernat, Stolp, Calhoun, & Adams, 1997 for an exception). Thus, this study addresses a gap in existing research by assessing outcomes throughout the task, allowing men to continuously make decisions about how to interact with a woman, when to initiate sexual activity, and how to respond to the woman's sexual refusals.

Theoretical Framework

Abbey (2002, 2011) argued that alcohol increases the likelihood of heterosexual acquaintance sexual assault at two points. The first stage involves assessment of sexual interest. Men who are looking for a potential romantic or sexual partner and men who are with a current romantic or sexual partner are likely to be watching for cues that indicate the woman's sexual interest. Expectancy confirmation theory (Snyder & Stukas, 1999) suggests that once individuals have formed a hypothesis, they tend to focus on cues that confirm it (e.g., she let me give her a back rub) and ignore cues that disconfirm it (e.g., she pushed me away when I reached under her shirt). This process can occur without alcohol, but it is likely to be exacerbated by alcohol's effects on higher-order cognitive functioning. Research demonstrates that acute alcohol consumption impairs many cognitive functions including abstract reasoning, attention allocation, set shifting, planning, and response inhibition (Abroms et al., 2003; Giancola, Josephs, Parrott, & Duke, 2010; Peterson, Rothfleisch, Zelazo, & Pihl, 1990). Thus, intoxicated individuals are more likely than sober individuals to focus on immediate, salient, superficial cues rather than distal, covert, embedded cues.

The second stage of Abbey's (2002, 2011) model involves hostility, anger, and aggression in response to sexual rejection. Gender roles and sexual scripts normalize some attempts to "work a yes out" (Vannier & O'Sullivan, 2011); however, most men desist when the woman repeatedly refuses them. Sexual assault perpetrators often endorse rape supportive cognitions, such as women say "no" when they mean "yes" and women who are sexual teases deserve what they get (Ryan, 2011). These distorted cognitions fuel and justify an aggressive response. Again, this process can occur without alcohol; however, it is likely to be exacerbated by alcohol among men prone to sexual aggression through the impaired, myopic cognitive processing deficits described above. Cues that usually inhibit aggression such as empathy for the victim and concern for future consequences are likely to be less salient than feelings of anger, frustration, sexual arousal, and entitlement, especially among men who are predisposed to sexual aggression (Abbey, 2002).

Overview of Study and Hypotheses

This paper describes the findings from an alcohol administration study conducted with a new sexual aggression paradigm in which male participants go on multiple dates with a female agent in a two-dimensional dating simulation. We are not aware of any sexual aggression proxies that provide participants with the opportunity to make repeated decisions about how to act in an unfolding interaction with a woman. Thus, this paradigm provides a partial test of Abbey's (2002, 2011) model and expands upon past research by allowing participants to make multiple choices throughout their interaction with the female agent, including decisions about how to respond if she refuses to engage in a desired sexual activity. As described in more detail in the Method section, male participants selected a female agent they wanted to date and viewed the situation from a first-person perspective on a high-definition computer screen. Participants were provided with a list of activities, which included nonsexual activities (e.g., talk to her), sexual activities in which she willingly engaged (e.g., kissing), and sexual activities she refused (e.g., vaginal sex). If participants continued to try unwanted sexual activities, her refusals became progressively stronger

culminating with a fifth refusal that ended the date. Participants were encouraged to talk to the woman throughout the simulation, as they would on an actual date.

The elements included in the simulation, including the decisions about what types of sex the woman would accept and refuse, were based on standard dating scripts and single-sex focus groups conducted by the research team with men and women. Traditional dating scripts in which men initiate sex and women serve as gatekeepers are still commonly endorsed (Vannier & O'Sullivan, 2011). Thus, we expected the majority of participants to initiate sexual activities with the woman, following a standard sexual script in which they would start with activities such as kissing, backrubs, and making out. As can be seen in Figure 1, we started the model with participants' self-reported desire to have sex with the woman and predicted that the more participants reported that they wanted sex, the more frequently they would select sexual activities in which the woman willingly engaged during the simulation, because they would initially follow the standard script and select "low level" activities such as kissing and making out (**H1**).

We expected many participants interested in engaging in sexual activities to receive a refusal at some point because they do not know the woman's sexual limits until they try something she refuses. We predicted that the more consensual sexual activities in which participants engaged, the more refusals they would receive based on the premise that men who were eager to try a lot of sexual activities in the simulation would be persistent despite refusals (**H2**). Furthermore, we predicted that the more refusals participants received, the more hostility they would express toward the woman because she was thwarting their sexual goals (**H3**).

We did not anticipate main effects of alcohol, based on previous research which suggests that the effects of alcohol often depend on situational and individual level factors (Abbey et al., 2014). Instead, we expected alcohol to have moderation effects at two points in the model (Abbey, 2002, 2011). First, we predicted that the relationship between number of consensual sexual activities and number of refused sexual activities would be dependent on alcohol intoxication (**H4**). We expected that this association would be stronger for intoxicated participants than sober participants. Although we did not assess cognitive processing directly, the pharmacological effects of alcohol described above suggest that intoxicated men would pay less attention to the woman's refusals and thus continue to be persistent despite them. Second, we predicted that the relationship between number of refused sexual activities and number of hostile verbal comments made to the woman would be stronger for intoxicated participants than sober participants (**H5**). Intoxicated men are expected to focus on how the woman is thwarting their sexual desires and be inattentive to her feelings; consequently, they are more likely to express hostility.

Many sexual assault, general aggression, and sexual risk-taking alcohol administration studies have found that placebo and no alcohol control groups do not significantly differ in their responses (Abbey et al., 2014; Bushman, 1993; Hull & Bond, 1986; Ito et al., 1996; Norris et al., 2002). Given that placebo beverages are rarely consumed in natural environments, we only included a no alcohol control group in this initial exploratory study.

Method

Participants

Given the study's focus and use of alcohol, participants were required to meet several criteria: age 21 to 29, dated a woman in the past two years, engaged in sexual activity with a woman (ranging from passionate kissing to sexual intercourse) at some point during their lifetime, and lived in the United States or Canada for at least 10 years. Following recommended criteria for participation in an alcohol administration study (National Institute on Alcohol Abuse and Alcoholism, 2004), participants were required to have consumed alcohol within the past 30 days and to have consumed at least four alcoholic beverages on one occasion in the past year (an amount comparable to what they would be consuming in the lab). Participants were not eligible if they had ever been hospitalized because of drinking, been arrested for driving after drinking, been treated for alcohol or drug abuse, or if they were taking any medications at the time of the study that contraindicate alcohol consumption.

The sample consisted of 62 men between the ages of 21–29 years (M = 23.32, SD = 2.29) who were recruited from a large urban university and the surrounding metropolitan community through flyers, online advertisements, and emails for a study of dating decisions and behavior. Approximately half of participants were community residents and half were students. Participants' self-reported ethnicity was 48.4% Caucasian, 16.1% African-American, 11.3% Asian, East Asian, or Pacific Islander, 11.3% Multiracial, 8.1% Arabic or Middle Easterner, 1.6% Hispanic, and 3.2% Other.

Procedures

Overview.—The university's institutional review board approved all study procedures. A phone screening was conducted to ensure that participants met the eligibility criteria described above. When participants arrived in the lab, they interacted with a male experimenter who reviewed their health screening information to verify that nothing had changed since scheduling that would make them ineligible. Participants provided photo identification to confirm their age. The experimenter reviewed the consent form with participants, which included a statement that their session would be audio recorded unless they requested that the microphone was turned off (none did).

Participants were then randomly assigned to either an alcohol (n = 31) or sober (n = 31) condition and told the actual content of their drink. Following a 15 min consumption period, participants were told that they would go on four virtual dates with a woman and that they should say to her whatever they would say to a date in real life. They were also instructed to make choices based on what they would do on an actual date. Participants were told that if they were curious about options they did not select, they could explore them after the study ended. After completing the simulation, participants completed a brief questionnaire on the computer.

Alcohol administration procedures.—Participants were breathalyzed (BrAC) to ensure they were sober at the start of the study (BrAC of 0.00% using Alco-Sensor IV,

Intoximeters, Inc., St. Louis, MO). They were weighed to determine the amount of alcohol required to achieve a peak BrAC of 0.080%. This alcohol level was selected based on past research which demonstrates that .08 is sufficient to impair a variety of cognitive functions (Peterson et al., 1990; Schweizer & Vogel-Sprott, 2008). Following well established protocols, participants in the alcohol condition were given a 2g/kg dose of 80 proof vodka mixed in a 3:1 ratio with diet lemon-lime soda (Corbin, Gearhardt, & Fromme, 2008; Rohsenow & Marlatt, 1981). Participants in the sober condition were given diet lemon-lime soda equal to the total fluid content of the alcohol formula.

Beverages were prepared by a graduate student supervisor, who poured equal portions into three cups. The male experimenter asked participants to consume the contents of each cup in 5 min, for a total of 15 min. After the 15 min consumption period ended, the experimenter provided instructions for the simulation which took approximately 5 min. Participants were then breathalyzed. In the alcohol condition, all participants were told their BrAC was 0.079 (Time 1) to standardize expectations; however, their actual BrAC was recorded by the experimenter. Participants then completed the dating simulation portion of the study (time spent in simulation $M = 32.28$ min, $SD = 17.22$) and were subsequently breathalyzed again. Participants in the alcohol condition were told that their BrAC was 0.080 (Time 2) regardless of their actual BrAC, again to standardize expectations. Participants in the sober condition were breathalyzed at each of these time points and told their actual BrAC reading of 0.00.

After the study ended, participants in the alcohol condition were breathalyzed every 30 min and released when their BrAC was < .005 (if driving) or < .03 (if a responsible party was picking them up). Participants were debriefed and compensated with $15/ hour, psychology department research credit, or a combination of the two.

Dating simulation.—WorldViz LLC developed the simulation for the second author using the Vizard technology and Python programming language. Participants viewed the simulation on a computer screen from a first-person perspective; thus, only their arms and legs were depicted on the screen. A brief backstory was provided before each date. On Date 1, participants were told they were acquaintances returning to the woman's apartment after a party. The relationship progressed across the dates, so that by the fourth date they had been seeing each other three months. At any point in the simulation, including after a refusal, participants could choose from the following options: watch TV, you drink some beer, she drinks some beer, you drink some water, she drinks some water, she talks about a topic (three included on first date; others added on later dates), you say something to her, get closer to her, or end date. When participants selected "you say something to her" they were provided a list of options regarding what they wanted to say: give her a compliment, tell her you care about her, apologize, insult her, threaten to end the relationship, or say whatever you want. If participants selected the "get closer" option, they moved closer to each other on the couch and a series of sexual options also appeared on the menu (and remained visible until that date ended).

The woman always consented to some lower level sexual activities (e.g., kiss, back massage) and following standard dating scripts, she consented to some additional sexual activities only on later dates (e.g., pull up shirt and touch breasts). However, the woman never consented to

higher level sexual activities (e.g., oral sex, vaginal sex) in the simulation. If a participant chose a sexual option that the woman would not accept, she refused. If he tried this sexual activity again (or another sexual activity at a similarly high level of intimacy, e.g., vaginal sex after oral sex was refused), he received another refusal. The woman's nonverbal (e.g., pushing him away) and verbal (e.g., saying "I told you, I don't want to do that!") cues became more direct and negative with each refusal. After the fifth refusal, the screen faded out and the date ended. Figure 2 provides screenshots from several refusals.

Sexual aggression was operationalized as the total number of refusals a participant received during the simulation. Abbey, Pegram, Woerner, and Wegner (2018) describe the development of the simulation and provide information about convergent and discriminant validity. In that study, male participants completed an online survey approximately one month before they completed the dating simulation. The number of refusals that participants received during the simulation was significantly correlated with their earlier self-reports of past sexual aggression, narcissism, sexual dominance, stereotypes that justify forced sex, number of past sexual partners, and friends' approval and pressure of using coercion or force to obtain sex. The number of refusals that participants received during the simulation was not significantly correlated with age, education, income, or social desirability.

Measures

Demographics.—Participants self-reported their age, ethnicity, number of years lived in the United States or Canada, the last time that they dated a woman, and their past sexual activities with a woman.

Simulation.—The number of sexual activities in which participants engaged with the female agent were summed across the four dates as a measure of **number of consensual sexual activities**. In a parallel, manner, the **number of sexual refusals received** was also summed across the four dates

The **number of hostile verbal comments** that participants made about the women came from two sources. First, we summed the number of times participants chose to tell their date that they wanted to "threaten to end the relationship" or "insult her." Second, we coded all the other comments participants made that were hostile toward the female agent using transcripts of the simulation that did not include information about participants' drink condition. Five categories of hostile statements were developed based on the literature and the initial reading of the transcripts by the research team. Table 1 provides illustrative statements within each category and their frequency of occurrence. The first, third, and fourth authors coded the number of times each statement was made, with two individuals double coding 20% of them. Agreement between the raters was 95.6%; the interrater reliability using Cohen's kappa was .87. The number of comments was summed across the five categories. The two indicators of hostile verbal comments provided as simulation options (i.e., threaten to end relationship and insult her) were positively correlated with the generated hostile statements coded from the other verbal response options and were not differentially related to other study variables; thus, they were all summed to create one composite index of hostility.

Post-simulation questionnaire.—Three items assessed participants' sexual interest in the woman: "How much would you want to have sex with someone like this woman?" (response options 1 *not at all* to 7 *very much*); "I was sexually aroused" (response options 1 *strongly disagree* to 7 *strongly agree);* and "I wanted to have sex with her" (response options 1 *strongly disagree* to 7 *strongly agree*). These three items were averaged to create a single index of **how much he wanted to have sex with the woman** (α = .88).

Results

Preliminary Analyses

Manipulation checks and BrAC.—All participants correctly identified which beverage they consumed. Additionally, on a 7-point scale indicating how intoxicated they felt (ranging from 1 *not at all intoxicated* to 7 *very intoxicated*), all the participants who consumed soda responded that they were not at all intoxicated and all the participants who consumed alcohol responded that they were at least somewhat intoxicated (M = 4.18, SD = 1.69). Participants' average BrAC was .084% (SD = .024) after absorption (with one participant's score missing due to equipment malfunction) and .070% (SD = .013) after the simulation.

Descriptive and bivariate information.—Participants were actively involved in the simulation (number of options selected, M = 79.81, SD = 49.69). Means, standard deviations, and bivariate correlations for the variables included in the conceptual model are provided in Table 2. There were no main effects of alcohol condition (p > .05). All but two of the participants engaged in some sexual activities to which the female agent consented during the simulation; the median number was 22. Across the four dates, participants received between zero and 20 total refusals (M = 4.61, SD = 4.21). Eight participants (12.9%) did not receive any refusals during the simulation, and an additional 40.3% (n = 25) of participants did not receive more than one refusal per date.

There were significant positive, bivariate correlations between how much the man wanted to have sex with consensual sexual activities as well as sexual refusals, between consensual sexual activities and refusals, and between refusals and hostile verbal comments (see Table 2). Participants could attempt a penetrative sexual activity without trying any lower level ones; thus, they could receive a refusal without engaging in any consensual activity.

Analytic Approach—Negative binomial regression analyses were conducted with Mplus software to assess the conceptual model depicted in Figure 1. The number of consensual sexual activities, number of sexual refusals received, and number of hostile verbal comments were specified as count variables in all analyses. Negative binomial regression is a generalized linear model used when outcome variables are counts (Gardner, Mulvey, & Shaw, 1995; Greene, 1994). Due to the violation of equidispersion assumed by Poisson regression, negative binomial regression is a more appropriate analytic approach than Poisson for these data (Gardner et al., 1995). In addition to a larger variance than mean for all count variables, a comparison of models (Swartout, Thompson, Koss, & Su, 2015) demonstrated that the negative binomial outperformed the Poisson regression model based on comparative fit indices (lower Akaike Information Criterion [1023 vs. 1593]) and

parameters suggesting significant overdispersion (hostile verbal comments: $\alpha = 2.17$, $p = .002$).

The model in Figure 1 was evaluated in stages prior to assessing the full model. The first component of the model was assessed by examining the effect of how much the man wanted sex on consensual sexual activities, the effect of consensual sexual activities on sexual refusals, and in turn, sexual refusals on hostile verbal comments (H1-H3). Second, two separate moderation analyses (H4, H5) were conducted to examine the effects of alcohol. The moderating effect of alcohol condition on the relationships between consensual sexual activities and number of sexual refusals was assessed; then, the moderating effect of alcohol condition on the association between sexual refusals and hostile verbal comments was assessed. Finally, the full model was examined. For completeness, all possible main effects were included in the estimated full models, although some were not expected to be significant. We did not attempt to evaluate indirect effects (e.g., from wanted sex to hostile verbal comments) because our goal was to assess the pattern of events that led up to men's aggression as suggested by the theoretical premise of this study, rather than the specific indirect effects of "he wanted sex" on subsequent aggression. Significance was determined through 95% confidence intervals; intervals that do not contain zero are statistically significant at $p < .05$.

Primary Analyses—In the first stage of analysis, how much the man wanted to have sex significantly predicted engaging in more consensual sexual activities, B (SE) = 0.13 (0.05), $p = .02$, 95% CI [0.03, 0.24], and consensual sexual activities in turn significantly predicted number of sexual refusals, B (SE) = 0.02 (.01), $p < .001$, 95% CI [0.01, 0.04]. Additionally, the number of sexual refusals significantly predicted hostile verbal comments, B (SE) = 0.29 (0.05), $p < .001$, 95% CI [0.19, 0.39].

Alcohol's moderating effect on the relationship between consensual sexual activities and number of sexual refusals was next examined. When both main effects were included, the significant main effect of consensual sexual activities on sexual refusals remained, B (SE) = 0.02 (0.01), $p = .01$, 95% CI [0.01, 0.03]; however, there was no main effect of alcohol condition, B (SE) = −0.38 (0.37), $p = .31$, 95% CI [−1.12, 0.35]. Furthermore, their interaction was significant, B (SE) = 0.02 (0.01), $p = .01$, 95% CI [0.01, 0.04]. As shown in Figure 3, there was a significant positive effect of consensual sexual activities on sexual refusals for participants in the sober condition, B (SE) = 0.02 (0.01), $p = .01$, 95% CI [0.01, 0.03], and in the alcohol condition B (SE) = 0.04 (0.01), $p < .001$, 95% CI [0.03, 0.05]. However, the magnitude of this positive effect was significantly stronger among men in the alcohol group.

Alcohol's moderating effects on the relationship between sexual refusals and number of hostile verbal comments was then examined. When both main effects were included, the significant main effect of sexual refusals on hostile verbal comments remained, B (SE) = 0.04 (0.13), $p = .003$, 95% CI [0.14, 0.65]; however, there was no main effect of alcohol condition, B (SE) = 1.79 (1.03), $p = .08$, 95% CI [−0.23, 3.81]. Contrary to the hypothesis, the interaction between sexual refusals and alcohol condition was not significant, B (SE) = −0.19 (0.15), $p = .19$, 95% CI [−0.48, 0.09].

The full path model was then assessed. As predicted, there was a significant positive effect of how much the man wanted sex on number of consensual sexual activities **(H1)**, $p = .02$, a significant positive main effect of consensual sexual activities on number of sexual refusals **(H2)**, $p = .01$, and a significant positive effect of sexual refusals on number of hostile verbal comments **(H3)**, $p < .001$. Also, as predicted, the association between consensual sexual activities and number of sexual refusals was significantly moderated by alcohol condition **(H4)**, $p = .004$. Because the predicted interaction between sexual refusals and alcohol condition (**H5**) was not significant in the previous stage of model building, it was not included in the final model. The pattern of these interactions was consistent with the results described above.[1] Full model results for all estimated paths are presented in Table 3.

Discussion

Past alcohol administration studies have presented participants with sexual assault scenarios which require them to indicate how they would think, feel, and behave in a similar situation using self-report questionnaires or by asking them to stop the action when they believe the man should go no further. Although much has been learned from these studies, they do not allow participants to develop the storyline by making their own choices throughout the unfolding situation. Thus, a strength of the current study is the focus on how men choose to behave in dating situations. Although almost all men chose to engage in some sexual activities, 13% of the sample received no refusals, meaning they only chose “lower level” sexual activities (e.g., did not try to engage in penetrative sex). Another 40% received no more than one refusal per date, indicating that they did not continue to push for sex after the woman set a limit.

There was partial support for Abbey’s (2002, 2011) model which predicts that alcohol can increase the likelihood of sexual aggression among individuals who are in a dating or sexual situation at multiple points in the interaction. Not surprisingly, the more men wanted to have sex with the woman, the greater the number of low level sexual activities they selected in the simulation, which means they experienced more consensual sexual activity. The more consensual sexual activities that occurred, the more participants persisted, regardless of the woman’s increasingly strong refusals; however, this association was significantly stronger for intoxicated men than sober men. These results are consistent with the first stage of our theoretical framework (Abbey, 2002, 2011) which suggests that intoxicated men may overly focus on a woman’s early cues that suggest mutual sexual interest, and disregard later cues which indicate that she is no longer interested.

Furthermore, the number of sexual refusals men received was positively related to the number of hostile verbal comments they made. Hostile comments included general expressions of anger and frustration with the woman’s actions, insults, threats to end the relationship, expressions of entitlement to sex, as well as nagging and pleading for sex. Some of the participants’ comments were extremely derogatory (Table 1), demonstrating

[1]The interpretation of results does not change when the moderator is perceived intoxication, BrAC immediately before the simulation, or BrAC immediately after the simulation rather than drink condition

both how seriously they took the simulation as well as the strength of their hostility toward women who thwart their sexual goals.

It was predicted that the relationship between sexual rejection and hostile verbal comments would be stronger for intoxicated men; however, contrary to prediction, the strength of this relationship did not differ across experimental conditions. There are several post hoc explanations for not finding a moderating effect of alcohol at this later stage. First, the biased information search initiated earlier when participants expected to have sex with the woman may have progressed too far by this point to be stopped by her refusals. Men who are hostile and keep persisting despite a woman's direct refusals may feel justified in forcing sex due to rape supportive cognitions such as "sexual teases deserve what they get" and "women say no when they mean yes" (Ryan, 2011). Second, it is likely that some perpetrators' extremely high levels of hostility toward women and strong need to be sexually dominant made them feel entitled to force themselves on the woman, whether they were intoxicated or sober. Third, for some participants, the woman's behavior in the simulation may not have created sufficient hostility for intoxication to exacerbate their likelihood of reacting in a hostile manner. Perpetrators' motives and situational triggers differ, thus multiple explanations need to be evaluated in future research.

Although cognitive impairment was not directly assessed, these findings support the prediction that intoxicated men focus on the cues that are most salient to them in the situation (in this case, her agreement to some sexual activities and their own desire for sex) and have great difficulty stopping once they have initiated sexual activity.

Strengths and Limitations

As previously stated, a major strength of this study was participants' control over what they said and did during the simulation. A related strength of this paradigm was the use of the first-person perspective. Participants viewed "their body" on the screen interacting with the female agent. Allowing participants to make multiple decisions about how to respond to a woman's sexual rejection increases the ecological validity of this paradigm. Another strength of this study was the inclusion of men from diverse ethnic backgrounds recruited from college and community sources.

This study also has several limitations. The study described in this paper was only the second study conducted with this simulation and the first to examine alcohol's effects; thus, it is important to replicate the findings. Many researchers time their studies such that blood alcohol levels are rising while participants are completing the study's central tasks because alcohol's cognitive and affective effects differ on the ascending and descending limbs (Addicott, Marsh-Richard, Mathias, & Dougherty, 2007; Hendler Ramchandani, Gilman, & Hommer, 2011). Although we followed a protocol successfully used by the second author in several previous studies which resulted in participants' BrACs peaking as the task ended (Abbey et al., 2003, 2005), in this study, the average BrAC level was declining at the end of the simulation. We did not interrupt the simulation to take additional BrAC readings; however, our simulation was longer than the tasks in most alcohol administration studies' tasks, so that it is likely that many participants' BrACs rose throughout much of the

simulation but began to decline toward the end. Despite this noteworthy deviation from other laboratory studies, it is likely that many perpetrators are on the descending limb at the point that the sexual assault occurs. Common narratives involve moving from a party or bar to the man or the woman's home and spending several hours together after drinking (Abbey et al., 2003; Rinehart & Yeater, 2011), during which time BrACs would decline. Future research should investigate whether responses to sexual aggression analogues differ on the ascending and descending limbs.

Another limitation concerns the temporal ordering of measures. We did not want to reduce participants' immersion in the simulation by asking questions during it; thus, the questions about how much participants wanted to have sex with the woman were asked after the simulation ended. It seems reasonable to assume that sexual desire will precede sexual activity in this dating simulation, although this relationship is likely to be bidirectional, with sexual activity also increasing sexual desire. It may be possible with new virtual reality technology to introduce more naturalistic opportunities for participants to record their thoughts and feelings during the simulation.

Research Contributions and Implications

There are many challenges and trade-offs associated with developing valid and ethical proxies of sexual aggression (Abbey & Wegner, 2015; Davis et al., 2014). Virtual reality technology provides the opportunity to develop immersive situations which allow participants to make decisions about how they will interact with other people. Future research can experimentally manipulate different aspects of the situation that have been linked to sexual aggression in past research to assess how these factors affect men's likelihood of persisting despite the woman's refusal or when she is too incapacitated to refuse. Based on survey research that describes sexual assault incidents, some important situational factors include the woman's intoxication, past sexual activity between the woman and man, and encouragement by the man's friends (Abbey et al., 2014; Jacques-Tiura et al., 2015; Livingston et al., 2004).

Future research should also include measures of individual difference characteristics that have been identified as risk factors for committing acts of sexual aggression. Some past alcohol administration research has found that alcohol increases sexual aggression proclivity only among men with high scores on risk factors, including sexual dominance and hostility (Abbey et al., 2014). The interaction that we expected (and did not find) between alcohol consumption and experiencing repeated refusals on participants' hostile comments about the woman may only occur among men with high levels of trait hostility toward women. Only a few alcohol administration studies have included individual difference measures as moderators; thus theoretical models such as the confluence model (Malamuth, 2003) could guide researchers' choices.

Although our findings are preliminary, further research that aims to replicate and extend this work may provide an opportunity to develop prevention programs. Adolescents and young adults are likely to be more involved and less defensive when information about sexual assault is provided in a virtual reality format (Jozkowski & Ekbia, 2015). Participants who

persist in sexual activities that the woman has refused could potentially see the scenario again from the woman's perspective which could highlight how upset she was by their actions. Some perpetrators lack empathy; however, others are likely to benefit from this type of perspective taking (DeGue et al., 2014). Simulations could also be used as part of motivational interviewing interventions to evoke more nuanced thinking about goals and motives. Rigorous evaluation research would be needed; however, these techniques have shown promise in reducing other harmful forms of behavior such as heavy drinking (Lewis, Neighbors, Oster-Aaland, Kirkeby, & Larimer, 2007).

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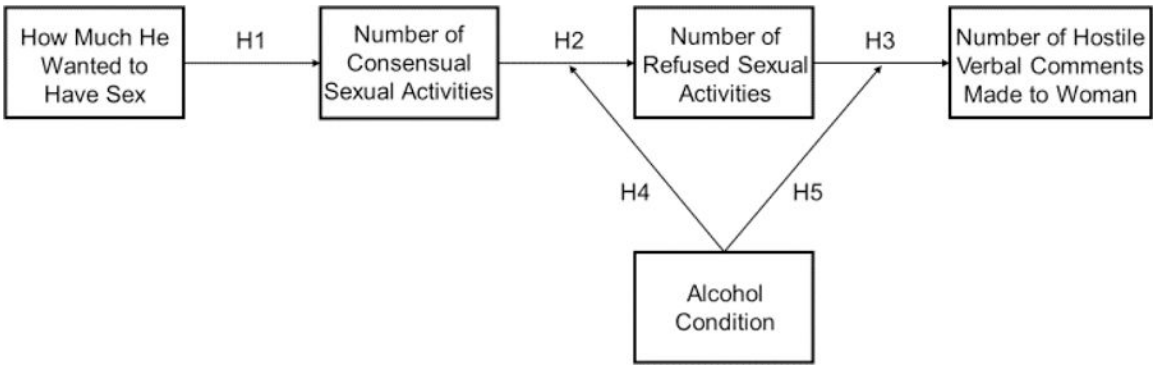

Figure 1.
Conceptual model.

Figure 2.

Screenshots of the female agents' escalating refusals.

(a) Top left: Screenshot of female agent's response the second time participant selects a type of sexual activity she refuses.

(b) Top right: Screenshot of female agent's response the third time participant selects a type of sexual activity she refuses.

(c) Bottom left: Screenshot of female agent's response the fifth time participant selects a type of sexual activity she refuses.

(d) Bottom right: Screenshot of female agent's "upset idle" phase displayed after the participant receives multiple refusals.

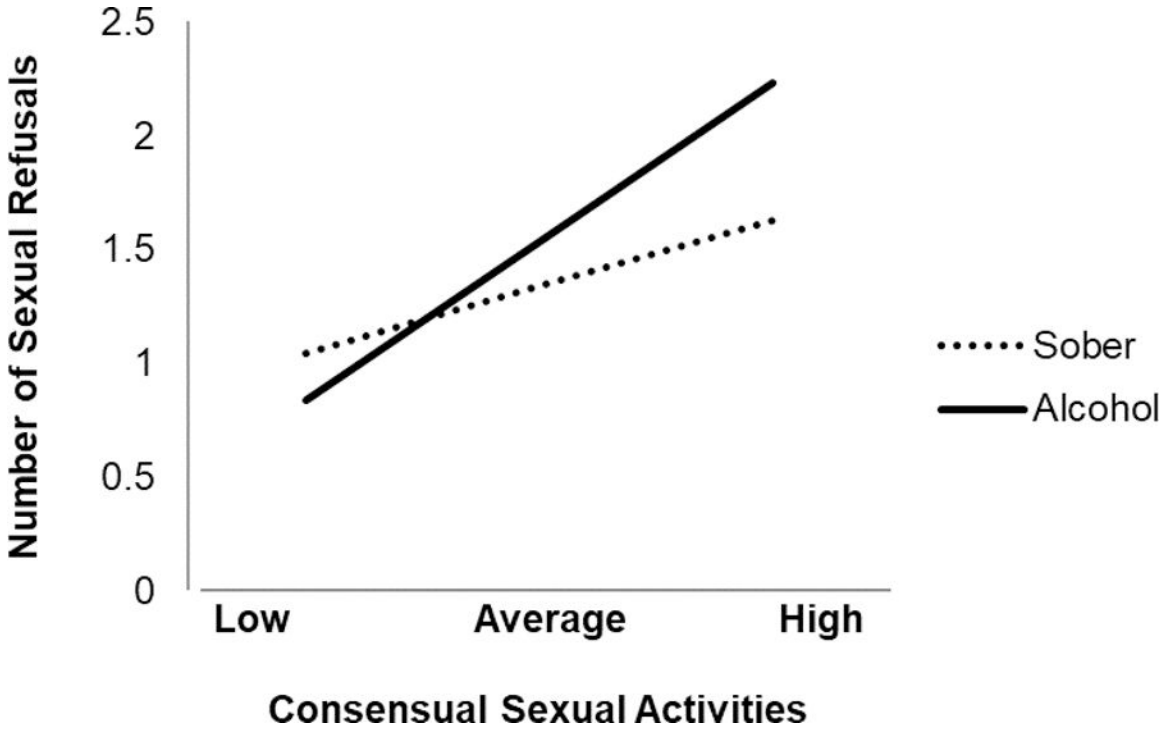

Figure 3.
Interaction between alcohol condition and consensual sexual activities on number of sexual refusals.

Table 1

Examples of Participants' Hostile Verbal Comments Towards Female Agent

Category	Range	No. of comments (total)		Example statements
Insult her	0−2	16	**1**	"You dirty bitch, you know you want it."
			2	"You whack…You look fucking goofy."
			3	"So, uhh what is going on with you? What's your nationality? You look kinda funny."
Threaten to end the relationship	0−7	22	**1**	"Bitch, you about to get left."
			2	"I'm about to kick yo' ass to the curb on some real shit."
			3	"Don't get broke up with, ha."
Entitlement	0−3	7	**1**	"You prude, we've been hanging out for months now."
			2	"Bitch, I just touched you with no t-shirt on. Alright, fuck it."
			3	"I have needs and we've been hanging out for a long time now."
Nagging/ pleading to get sex	0−8	26	**1**	"Why? Why not have sex right now?"
			2	"Take your shirt off! Damn!"
			3	"Now I'm about to touch you without pants. Ugh! Are you serious? Let me get there. You're taking too long."
Anger/ frustration with her	0−22	85	**1**	"Please shut up, please shut the fuck up."
			2	"It's been two minutes since you been talkin' about your brother. I don't give a fuck no more."
			3	"Boo! What kind of first date is this? Boo!"
Total	0−33	156		

Table 2

Descriptive Information and Correlations (N = 62)

	1	2	3	4
1. Man Wanted Sex	-			
2. Consensual Sexual Activities	.25 *	-		
3. Sexual Refusals	.32 *	.53 **	-	
4. Hostile Verbal Comments	.09	.01	.52 **	-
M (*SD*)	4.85 (1.66)	24.58 (17.15)	4.61 (4.21)	2.52 (6.03)

* Note. $p < .05$

** $p < .01$.

Table 3

Results for Full Model

	B (*SE*)	*p*	95% CI: [LL, UP]
Outcome: Consensual Sex			
Intercept	2.55 (.30)	<.01**	[1.96, 3.13]
Man Wanted Sex **(H1)**	0.13 (.05)	.02*	[0.03, 0.24]
Outcome: Sexual Refusals			
Intercept	0.33 (.50)	.51	[−0.65, 1.31]
Man Wanted Sex	0.15 (.07)	.04*	[0.01, 0.29]
Consensual Sex **(H2)**	0.01 (.01)	<.01**	[0.00, 0.02]
Alcohol Condition	−0.54 (.33)	.10	[−1.18, 0.10]
Alcohol X Consensual Sex **(H4)**	0.02 (.01)	<.01**	[0.01, 0.04]
Outcome: Hostile Verbal Comments			
Intercept	−0.59 (.65)	.36	[0.83, 3.51]
Man Wanted Sex	−0.04 (.16)	.79	[−.036, 0.28]
Consensual Sex	−0.02 (.01)	.05*	[−0.05, 0.00]
Sexual Refusals **(H3)**	0.29 (.05)	<.01**	[0.19, 0.40]
Alcohol Condition	0.51 (.51)	.32	[−0.49, 1.51]

*Note. $p < .05$

**$p < .01$.