

Exploring the Link between Alcohol Consumption, Blacking out, Sexual Assault, and Hooking up via a Social Network Analysis

Dana Nocera
Kinesiology and Health
Miami University
501 East High Street
Oxford, Ohio 45056 USA

Faculty Advisor: Dr. Rose Marie Ward

Abstract

Despite intervention efforts, college campuses across the nation continue to be affected by alcohol consumption, regardless of the prestige, size, and location of the university. Alcohol consumption has several associated risky behaviors, such as “hooking up.” The current study defines “hooking up” as engaging in physically intimate behaviors, ranging from kissing to sexual intercourse, with no committed relationship or expectation of a future relationship. Another risky behavior associated with alcohol consumption is blacking out. Blacking out is defined as a period of time during a drinking event in which an individual cannot recall all or parts of the event. Blacking out can lead to many consequences, such as sexual assault. Sexual assault is a broad term that includes not only completed rape, but also attempted rape, verbally coerced intercourse, and unwanted sexual contact. To replicate previous literature, the current study sought to determine if hooking up and alcohol consumption is linked. To extend previous literature, the current study sought to perform a social network analysis to determine the extent to which college students’ behaviors and attitudes are influenced by their close friends and acquaintances. The current study went further to determine the relationship between alcohol-related blackouts and sexual assault experiences. Data for this study were collected on a sorority at a Midwestern university with 84 females participating. Data were collected via an online survey during the end of the fall 2015 semester. The number of days the participants reported drinking in a typical week and if they hooked up with someone in the past week were significantly positively correlated, $r(75) = -.51, p < .001$. The more drinking buddies that were reported, the more days the participant reported drinking, $r(75) = .41, p < .001$. The more drinking buddies that were reported, the more drinks the participant reporting having on a typical drinking day, $r(75) = .38, p < .001$. Furthermore, the more drinking buddies that were reported, the higher their peak drinking occasion, $r(74) = .32, p = .005$, and the more drinking buddies that were reported, the more problems they reported on the RAPI, $r(76) = .25, p = .029$. With regards to hooking up, there were no significant relationships between hooking up behaviors and the amount of drinking buddies. Furthermore, there were no significant relationships between victimization of sexual assault and the amount of drinking buddies. With regards to sexual assault experiences during an alcohol-related blackout, it was found that 39.3% of the participants were non-victims, 1.2% experienced unwanted sexual contact, 10.7% experienced attempted rape, and 7.1% experienced rape. Future intervention efforts could potentially use this information to tailor materials against having a high number of drinking buddies or against alcohol-related blackouts. Messages could address the relationship between the number of drinking buddies and the number of negative consequences from drinking as well as the relationship between alcohol-related blackouts and sexual assault experiences.

Keywords: Hooking up, Blackout, Sexual assault, Social Network Analysis

1. Introduction

Regardless of prestige, size, and location, college campuses across today's nation continue to be affected by alcohol consumption. Each year, approximately 1,825 students at the collegiate level die from excessive alcohol consumption⁵. In addition, excessive alcohol consumption is the third leading lifestyle-related cause of death across the nation⁶. Furthermore, universities expend a large fortune of money to cover costs for the effects from damage done due to alcohol consumption. Specifically, an estimated \$500,000 per year is spent on hospitalization procedures done as a result of alcohol related blackouts⁷. Money is also expended by universities to cover costs that result from damage done by intoxicated students, misconduct violations, and more. Moreover, a vast portion of students at the collegiate level are under the age of 21, thus consuming alcohol puts many college students at risk of getting into legal trouble.

Alcohol consumption has several associated risky behaviors, such as hooking up. Many previous research studies have aimed to define hooking up, but the definition remains ambiguous. Based on what previous research has shown, the authors of this study define hooking up as engaging in physically intimate behaviors, ranging from kissing to sexual intercourse, with no committed relationship or expectation of a future relationship^{1, 2}. It is well known that hooking up is linked to alcohol consumption as many previous research studies have analyzed this relationship, and the results have been consistent. Often times, college students engage in hooking up behaviors as a result of their drinking and come to regret it later. In one study, 17.5% of the 88% of those who reported binge drinking in the past four weeks reported a sexual encounter that they later regretted⁸. Another study that asked questions regarding the participant's hookup history found that the most frequent responses for why a hookup occurs are "judgment impaired by alcohol" (62.2%) or "taken advantage of because I was wasted" (32.4%)⁹. Furthermore, another study found that 65.4% of the participants who reported hooking up with someone said that they engaged in heavy episodic drinking before hooking up with someone¹⁰. Heavy episodic drinking is defined as consuming 5 or more drinks in a row for men and 4 or more drinks in a row for women¹⁰. The consumption of alcohol before a hookup can be dangerous in many ways. One specific way this is risky is because it often leads to unprotected and unsafe sex, which can ultimately lead to sexually transmitted infections or unwanted pregnancy¹⁰.

Blacking out, also referred to as anterograde amnesia or acute alcohol-induced memory dysfunction, is another associated risky behavior associated with alcohol consumption. There are two types of blacking out: fragmentary and en bloc. A fragmentary blackout is when the person remembers some parts of the drinking period but does not remember others³. This can also be referred to as a grayout. An en bloc blackout is when there is complete memory loss and the person does not remember a certain chunk of time during their drinking episode³. For the purpose of this study, blacking out is defined as a period of time during a drinking event in which an individual cannot recall all or parts of the event. This study focuses on both en bloc blackouts and fragmentary blackouts. It is well known that heavy alcohol consumption leads to blacking out, as many previous research studies have shown this. Previous research has found that at least half of college student drinkers have experienced at least one alcohol-induced blackout in their lifetimes¹¹. Of those who report blacking out, fragmentary blackouts are far more common than en bloc blackouts, with only 22% reporting having experienced an en bloc blackout¹¹. One particular study found that blackouts are likely to recur, suggesting that students do not attempt to avoid blacking out¹². Blacking out is an issue for many reasons, but specifically because of the consequences that result from the blackout. Previous research has found that 38% of the participants reported being in a fight while blacked out, 25% reported vandalizing property while blacked out, and 12.5% had operated a motor vehicle while blacked out¹¹.

Perhaps one of the worst consequences of a blackout is when a sexual assault occurs. Sexual assault is a broad term that includes not only completed rape, but also attempted rape, verbally coerced intercourse, and unwanted sexual contact⁴. Rape has been defined as unwanted sexual activity when the victim is incapacitated by alcohol, either as a result of their voluntary consumption or because substances were administered to the victim by the perpetrator for the purpose of incapacitating the victim⁴. Sexual assault is a very serious issue on college campuses that is not to be taken lightly. Research has consistently shown that sexual assault frequently occurs at the collegiate level. It has been found that almost 20% of college women experience some type of completed sexual assault by winter of their senior years¹³. It is also important to note that 73.15% of sexual assault cases involve an offender and victim that knew each other¹⁴.

Sexual assault has been consistently linked with alcohol consumption, whether that be by the perpetrator, the victim, or both. In fact, one research study found that 14% of female drinkers reported having been taken advantage of sexually during the past year as a result of their drinking¹⁵. Another study found that 32% of the participants who reported drinking at least once during the school year also reported having a regretted sexual experience¹². It has been consistently shown that unhappy and regretted sexual encounters are strongly associated with heavier drinking^{8, 16}. To support this, one study found that more than 31% of women who reported weekly heavy episodic drinking reported a

sexual assault in their first-year of college compared with 17% of women who reported weekly drinking, but not heavy episodic drinking¹⁶. While it is clear that there is a link between sexual assault and alcohol use, it is unclear as to whether the sexual assault was done while the victim was blacked out, while the perpetrator was blacked out, or while both were blacked out. Some research suggests that blacking out and sexual assault may be linked. It has been reported that 20% of those who reported a hookup also reported that they had to rely on friends' stories the next day to piece together what had happened during the hookup, thus implying that they were blacked out¹⁷. Hooking up while blacked out is a serious issue because of the sexual assault aspect. If one of the partners were blacked out, then it cannot be said for certain that consent was given, thus resulting in sexual assault.

One way to analyze drinking behaviors and risky behaviors is through a social network analysis. In today's society, individuals rely heavily on the opinions of others, especially the opinions of their close friends. Research has shown that alcohol consumption behaviors are spread through social networks¹⁸. It is apparent that one's alcohol consumption behaviors are greatly influenced by social ties as many research studies have already shown this¹⁹. A social network analysis is a method that examines how social environment impacts an individual's behaviors and beliefs, specifically how the norms of one's social group influence their own behaviors and beliefs²⁰. A social network analysis is constructed by asking participants to identify who is in their social network and to answer questions about certain characteristics about the people that they list.

To replicate previous literature, the current study sought to determine if hooking up and alcohol consumption is linked. To extend previous literature, the current study sought to perform a social network analysis to determine the extent to which college students' behaviors and attitudes are influenced by their close friends and acquaintances. The current study went further to determine the relationship between alcohol-related blackouts and sexual assault experiences. By analyzing these results, it can be determined what future interventions need to be done. It is expected that hooking up and alcohol consumption are linked. It is also expected that college students' behaviors and attitudes will be greatly influenced by their friends and acquaintances. Lastly, it is expected that there will be more sexual assault experiences reported for those who were blacked out during the assault. The research questions included: 1. Are college students' behaviors and attitudes influenced by their friends and acquaintances?, and 2. Are college students more likely to experience a sexual assault if they were blacked out versus being sober?

2. Methods

2.1 Participants

The current study surveyed college females from a particular sorority at a Midwestern university ($n = 84$); most reported being Caucasian (96.4%). The mean age was 20.19 years old ($SD = 0.85$). Approximately 83.3% came from households where their parents are still married. The majority (90.5%) of the participants identified as being completely heterosexual. About 65.5% of the participants reported not being in a committed romantic/dating relationship or marriage.

2.2 Procedure

The authors' Institutional Review Board at Miami University approved all procedures prior to commencement of the study. The primary investigators attended a chapter meeting of the sorority that participated where the study was explained and the role of the participants was clarified. Each member of the sorority then received an email with a link to the survey and a link to remove their name from the survey. Upon completion of the survey, the participant received \$10 cash. Data collection took place in the fall of 2015 and money collection took place in the spring of 2016.

2.3 Measures

2.3.1 alcohol consumption

Using standard measures in the alcohol literature, the survey provided the definition of a standard drink and asked the following questions: Have you ever had an alcoholic beverage to drink (more than a sip or taste)? (response options: yes or no); At what age did you have your first drink?; In a typical week, on how many days do you have at least one drink containing alcohol?; How many drinks do you have on a typical day when you are drinking?; During the last 30 days, what is the highest number of drinks that you consumed on any one drinking occasion?

2.3.2 hooking up behavior

With regards to hooking up, the participants were provided with the definition of hooking up (engaging in physically intimate behaviors, ranging from kissing to sexual intercourse, with no committed relationship or expectation of a future relationship) and were asked the following questions: During this past week (past 7 days), did you hookup with anyone? (response options: yes or no); How many different times did you hookup with someone in the past 7 days?; How many different hookup partners did you have in the past 7 days?

2.3.3 blacking out behavior

With regards to blacking out, the participants were provided with the definition of an alcohol-related blackout and were asked the following questions: Have you ever had a blackout?; In the past 30 days, have you had a blackout as a result of your alcohol consumption?; During an alcohol-related blackout, has anyone ever: fondled, kissed, or touched you sexually when you indicated that you didn't want to (response options: yes or no), tried to have sexual intercourse with you (but it did not happen) when you indicated that you didn't want to (response options: yes or no), succeeded in making you have sexual intercourse when you indicated that you didn't want to (response options: yes or no), made you do oral sex or had it done to you when you indicated that you didn't want to (response options: yes or no), made you have anal sex or penetrated you with a finger or objects when you indicated that you didn't want to (response options: yes or no)?; Have you ever regained memories from an alcohol-related blackout and realized that someone had: same response choices as previous question; Did you ever have someone tell you that during your alcohol-related blackout someone had: same response choices as previous two questions; How did you feel about having had the blackout?; Were there any long-lasting repercussions?; Did the experience affect your drinking habits?

2.3.4 hookup versus sexual assault

To determine the difference between a hookup and a sexual assault during an alcohol-related blackout, the following scenarios were laid out and each participant had to rate from 0% to 100% the extent to which they thought the situation was a hookup as well as the extent to which they thought the situation was a sexual assault: You meet someone new (variation: you are with a friend) at a party/bar and you have both been drinking throughout the night. At the end of the night, you mutually agree to go home together and proceed to engage in sexual intercourse. By the time you get home, you were both blacked out and neither of you remember any part (variation: you remember some but not all) of the sexual encounter; You meet someone new (variation: you are with a friend) at a party/bar and you have both been drinking throughout the night. By the end of the night, you are blacked out. You wake up in the other person's bed, unable to remember anything that happened (variation: only remembering parts of what happened) during the night. When you ask the person if you two engaged in sexual activity, they say that you had sexual intercourse (variation: they say you went beyond kissing, but did not have sexual intercourse).

2.3.5 social network analysis

The participants were provided with a list of every member of their sorority and were told to indicate which members they consider to be their drinking buddy. A "drinking buddy" was defined as an individual with whom they go drinking or attend parties/bars/nightclubs with on a regular basis. Of the members they selected, they were then asked the nature of their relationship with that person (i.e. big, little, twin, sorority sister, etc.).

2.3.6 Rutgers Alcohol Problem Index (RAPI)

The frequency of experiencing alcohol-related negative consequences was measured using Rutgers Alcohol Problem Index²¹. The RAPI is a 23 question survey that asks participants to rank the frequency of experiencing 23 negative consequences on a scale of 0-4, where 0=never, 1=1 to 2 times, 2=3 to 5 times, 3=6 to 10 times, and 4=more than 10 times. The survey prompted participants with "Different things happen to people while they are drinking alcohol or because of their alcohol drinking. Indicate how many times each of these things happened to you within the last year." Sample consequences include "went to work or school high or drunk," and "felt physically or psychologically dependent on alcohol."

3. Results

The current study had two questions: 1. Are college students' behaviors and attitudes influenced by their friends and acquaintances?, and 2. Are college students more likely to experience a sexual assault if they were blacked out versus being sober? In a sample of sorority members from a Midwestern mid-sized university, the drinking levels, blackout behaviors, hookup behaviors, and sexual assault history were examined. Additionally, the connections between the sorority members were analyzed via a social network analysis. The network provided a visual representation of the connections between the sorority members and a measure of the connectedness or centrality of each member.

3.1 Alcohol history

On average, the females from this sorority reported drinking an average of 2.13 ($SD = 1.21$) days a week. Also, on average, the females from this sorority reported drinking 3.65 ($SD = 1.66$) drinks on a typical drinking day. The average peak drinking occasion reported by the females of the sorority was 6.65 drinks ($SD = 3.24$). Furthermore, 70.2% of the participants reported having had 4 or more drinks in a row on one drinking occasion in the past month.

Approximately 60.7% of the participants reported that they have had a blackout in the past year. It was also found that 33.3% of the participants had a blackout in the past 30 days. It was also found that 8.3% of those who reported having a blackout reported that the blackout was an en bloc blackout while 52.3% reported that the blackout was fragmentary.

3.2 Hooking up history

With regards to hooking up, the participants had an average of 1.16 ($SD = 2.51$) sexual encounters in the past week, but only 19.0% of the participants reported hooking up with someone in the past week. Of the people who reported hooking up, they hooked up with someone an average of 3.63 ($SD = 5.39$) times in the past week, and they had an average of 1.19 ($SD = 0.40$) hookup partners. To determine if hooking up and alcohol consumption were related, Pearson correlations were run with a significance level of 0.05. The number of days the participants reported drinking in a typical week and if they hooked up with someone in the past week were significantly positively correlated, $r(75) = -.51, p < .001$.

3.3 Sexual assault history

With regards to sexual assault experiences in general since age 14 (i.e., any sexual assault experience whether they were sober or intoxicated – they did not deal explicitly with alcohol), it was found that 56.0% of the participants were non-victims, 7.1% experienced unwanted sexual contact, 4.8% experienced attempted coercion, 9.5% experienced coercion, 7.1% experienced attempted rape, and 6.0% experienced rape. More specifically, with regards to sexual assault experiences during an alcohol-related blackout, it was found that 39.3% of the participants were non-victims, 1.2% experienced unwanted sexual contact, 10.7% experienced attempted rape, and 7.1% experienced rape.

3.4 Social network results

To determine if the participants' behaviors were influenced by their friends' behaviors, Pearson correlations were run with a significance level of 0.05. The more drinking buddies that were reported, the more days the participant reported drinking, $r(75) = .41, p < .001$. The more drinking buddies that were reported, the more drinks the participant reporting having on a typical drinking day, $r(75) = .38, p < .001$. Furthermore, the more drinking buddies that were reported, the higher their peak drinking occasion, $r(74) = .32, p = .005$, and the more drinking buddies that were reported, the more problems they reported on the RAPI, $r(76) = .25, p = .029$. With regards to hooking up, there were no significant relationships between hooking up behaviors and the amount of drinking buddies. Furthermore, there were no significant relationships between victimization of sexual assault and the amount of drinking buddies.

4. Discussion

This study was designed to determine if college students' behaviors and attitudes are influenced by their friends and acquaintances. It was also designed to determine the relationship between sexual assault experiences and alcohol use. This study is unique because it constructs a social network that can be used to look at relationships between the participants.

This social network analysis of college sorority members revealed that alcohol consumption patterns and alcohol-related negative consequences are influenced by the composition of an individuals' social ties. It also revealed that hooking up behaviors are not influenced by the composition of an individuals' social ties. Furthermore, there were no significant relationships between victimization of sexual assault and the amount of drinking buddies. With regards to sexual assault experiences, the study showed that the percentage of participants who experienced rape and attempted rape was higher for those who experienced the assault during an alcohol-related blackout than for those who experienced the assault when they were sober.

As in any study, this study had limitations. Since the method of the study was a survey, the students might not have answered the questions truthfully in fear of getting into legal trouble. Additionally, the students might not have correctly remembered the answers to the questions, so the data might not have been accurate. The survey took participants from a homogenous background. They were mostly all the same race and ethnicity. This limited the study because it did not make for a variety of participants, so the data could have been skewed. Furthermore, since the study included only one sorority, there could have been bias with how the participants responded.

Overall, this study replicated and extended previous literature. It showed that alcohol consumption and hooking up are related. It also showed how one's social ties can influence their behaviors. Finally, it showed the relationship between alcohol-related blackouts and sexual assault experiences. Because of the results, future interventions could be tailored to female college students who have a larger network of drinking buddies. Future intervention efforts could potentially use this information to tailor materials against having a high number of drinking buddies or against alcohol-related blackouts. Messages could address the relationship between the number of drinking buddies and the number of negative consequences from drinking as well as the relationship between alcohol-related blackouts and sexual assault experiences. It is important to understand these results in order to decrease the amount of negative consequences that result from alcohol consumption. These results can help lessen the issue of alcohol consumption amongst college students.

5. Acknowledgements

The author wishes to express their appreciation to Dr. Rose Marie Ward, the Undergraduate Presentation Award at Miami University, the Office for the Advancement of Research and Scholarship at Miami University, and Miami University's Kinesiology and Health Department.

6. Cite References

6.1 References

1. Labrie, J. W., Hummer, J. F., Ghaidarov, T. M., Lac, A., & Kenney, S. R. (2014). Hooking up in the college context: The event-level effects of alcohol use and partner familiarity on hookup behaviors and contentment. *Journal of Sex Research, 51*(1), 62-74.
2. Owen, J. J., Rhoades, G. K., Stanley, S. M., & Fincham, F. D. (2010). Hooking up among college students: Demographic and psychosocial correlates. *Archives of Sexual Behavior, 39*, 653-663.
3. Labrie, J. W., Hummer, J., Kenney, S., Lac, A., & Pedersen, E. (2011). Identifying factors that increase the likelihood for alcohol-induced blackouts in the prepartying context. *Substance Use & Misuse, 46*: 992-1002.
4. Testa, M. and Livingston, J. A. (2009). Alcohol consumption and women's vulnerability to sexual victimization: Can reducing women's drinking prevent rape? *Substance Use & Misuse, 44*: 1349-1376.
5. Hingson, R. W., Zha, W., & Weitzman, E. R. (2009). Magnitude of and trends in alcohol-related mortality and morbidity among U. S. college students ages 18-24, 1998-2005. *Journal of Studies on Alcohol and Drugs Supplement, 16*, 12-20.

6. Mokdad A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual cases of death in the United States. *The Journal of the American Medical Association*, *291*(10), 1238-1245.
7. Mundt J. C., Marks, I. M., Shear, M. K., & Greist, J. M. (2012). The work and social adjustment scale: a simple measure of impairment in functioning. *The British Journal of Psychiatry*, *180*, 461-464.
8. Connor, J., Gray, A., & Kypri, K. (2010). Drinking history, current drinking and problematic sexual experiences among university students. *Australian and New Zealand Journal of Public Health*, *34*(5), 487-494.
9. Flack, W. F., Daubman, K. A., Caron, M. L., Asadorian, J. A., D'Aureli, N. R., Gigliotti, S. N. ... Stine, E. R. (2007). Risk factors and consequences of unwanted sex among university students: Hooking up, alcohol, and stress response. *Journal of Interpersonal Violence*, *22*(2), 139-157.
10. Lewis, M. A., Granato, H., Blayney, J. A., Lostutter, T. W., & Kilmer, J. R. (2012). Predictors of hooking up sexual behaviors and emotional reactions among U.S. college students. *Archives of Sexual Behavior*, *41*, 1219-1229.
11. White, A. M., Signer, M. L., Kraus, C. L., & Swartzwelder, H. S. (2004). Experiential aspects of alcohol-induced blackouts among college students. *The American Journal of Drug and Alcohol Abuse*, *30*(1), 205-224.
12. Barnett, N. P., Clerkin, E. M., Wood, M., Monti, P. M., Tevyaw, T. O., Corriveau, D. ... Kahler, C. W. (2014). Description and predictors of positive and negative alcohol-related consequences in the first year of college. *Journal of Studies on Alcohol and Drugs*, *75*(1), 103-114.
13. Krebs, C. P., Lindquist, C. H., Warner, T. D., Fisher, B. S., & Martin, S. L. (2009). College women's experiences with physically forced, alcohol- or other drug-enabled, and drug-facilitated sexual assault before and since entering college. *Journal of American College Health*, *57*(6), 639-647.
14. Horvath, M. A. and Brown, J. (2006). The role of drugs and alcohol use in rape. *Medicine, Science, and the Law*, *46*(3), 219-228.
15. Clinton-Sherrod, M., Moran-Lopez, A. A., Brown, J. M., McMillen, B. A., & Cowells, A. (2011). Incapacitated sexual violence involving alcohol among college women: The impact of a brief drinking intervention. *Violence Against Women*, *17*(1): 135-154.
16. Mouilso, E. R., Fischer, S., & Calhoun, K. S. (2012). A prospective study of sexual assault and alcohol use among first-year college women. *Violence and Victims*, *27*(1), 78-94.
17. Paul, E. L., McManus, B., & Hayes, A. (2010). Hookups: Characteristics and correlates of college students' spontaneous and anonymous sexual experiences. *The Journal of Sex Research*, *37*(1), 76-88.
18. Rosenquist, J. N., Murabito, J., Fowler, J. H., & Christakis, N. A. (2010). The spread of alcohol consumption behavior in a large social network. *Annals of Internal Medicine*, *152*(7), 426-433.
19. Reboussin, B. A., Song, E. Y., & Wolfson, M. (2012). Social influences on the clustering of underage risky drinking and its consequences in communities. *Journal of Studies on Alcohol and Drugs*, *73*(6), 890-898.
20. Valente, T. W., Gallaher, P., & Mouttapa, M. (2004). Using social networks to understand and prevent substance use: A transdisciplinary perspective. *Substance Use & Misuse*, *39*(10-12), 1685-1712.
21. White, H. R. & Labouvie, E. W. (1989). Toward the assessment of adolescent problem drinking. *Journal of Studies on Alcohol* *50*, 30-37.