LIBATIONS AND LOCATIONS: UNDERSTANDING THE RELATIONSHIP BETWEEN ALCOHOL USE BEHAVIORS AND RESIDENTIAL PROXIMITY TO ALCOHOL OUTLETS IN COLLEGE FRATERNITY & SORORITY MEMBERS AT SOUTHEASTERN UNIVERSITIES

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Alcohol use among fraternity and sorority members presents a concerning trend with harmful consequences (DeSimone, 2009; McCreary et al., 2021; Nuwer, 2001; Ranker & Lipson, 2022). Central to that trend, the availability theory of alcohol-related problems suggests that alcohol use could be influenced by the availability of alcohol outlets in the environment (Dimova et al., 2023; Kypri et al., 2008; Single, 1984). This study examined the relationship between alcohol consumption behaviors and alcohol outlet proximity with fraternity- and sorority-affiliated students at Southeastern Conference schools. Results indicated a statistically significant relationship between the variables with fraternity members but not with sorority members.

Keywords: Fraternity, Sorority, Alcohol Availability, Student Affairs, Substance Use

In my research I have identified a substantial body of research and historical anecdotes highlighting the concerning relationship between high-risk alcohol use and college students, especially with fraternity- and sorority-affiliated students (Andone, 2017; Capone et al., 2007; DeSimone, 2009; Levenson, 2017; McCreary et al., 2021; Nuwer, 2001; Patrick et al., 2022; Ragsdale et al., 2012; Ranker & Lipson, 2022; Routon & Walker, 2014; Wechsler et al., 2009). Impacting that relationship, college fraternity and sorority members' alcohol-use behaviors are typically associated with influences known as selection and socialization (Borsari et al., 2009; Larimer et al., 2000; McCabe et al., 2005, 2018). Selection is the idea that high-risk individuals self-select into joining groups of organizations, people, and/or environments known to engage in similar behaviors (DeSimone, 2009). Socialization is the encouraged or learned behaviors individuals exhibit while in that environment (McCabe et al., 2005).

In examining the harms associated with alcohol use, I found that U.S. alcohol-related deaths are considered the fourth leading cause of preventable death annually (National Institute on Alcohol Abuse and Alcoholism, 2023a, p. 1). Fraternity and sorority alcohol-related deaths, specifically, have occurred at numerous institutions over an extended period of their existence (Nuwer, 2023). However, there has been a small number of nationally publicized examples of fraternity and sorority alcohol-related deaths since 2021. Even with that recent trend, alcohol-related deaths are not the only measure available to highlight

the detrimental harms alcohol use can have on college-aged fraternity and sorority members. Both short- and long-term psychological and physiological effects can come from heavy episodic drinking (Brick, 2008). Additionally, college-aged adults who consume alcohol increase their risk for legal consequences, injury, suicide, crime victimization, and other health and social consequences (Trapp et al., 2018; Turrisi et al., 2006).

To this date, I have found no studies evaluating the impact a college city's environmental design has on alcohol consumption behaviors in fraternity and sorority membership, especially through the lens of alcohol outlet proximity. In this study, I explored the relationship between alcohol outlet proximity (i.e., nearest distance to an alcohol outlet from one's residence) with alcohol use behaviors (via weekly binge drinking counts and a general alcohol consumption scale called AUDIT-C) in college fraternity and sorority members. Members associated with Interfraternity Council (IFC) chapters and National Panhellenic Conference (NPC) chapters were the population of interest. Given that members of these organizations are typically more "engaged in heavy episodic drinking, rather than members of other councils" they were the group selected as the population of interest in my study (Myers & Sasso, 2022, p. 3).

Consistent with the availability theory of alcohol-related problems, which theorizes that greater access to alcohol leads to greater consumption and thus greater related consequences, the higher propensity for problematic alcohol use in these groups creates a research priority given the potential alcohol-related harms (Capone et al., 2007; DeSimone, 2009; Dimova, 2023; Hingson et al., 2017; McCabe et al., 2005; McCreary et al., 2021; National Institute on Alcohol Abuse and Alcoholism, 2023b; Nuwer, 2001; Patrick et al., 2022; Ragsdale et al., 2012; Ranker & Lipson, 2022; Routon & Walker, 2014; Sacks et al., 2010; Single, 1984; Trapp et al., 2018; Turrisi et al., 2006). Understanding risk factors associated with problematic drinking amongst these groups is critical in furthering the literature connected to this subpopulation and informing potential policy or prevention implications.

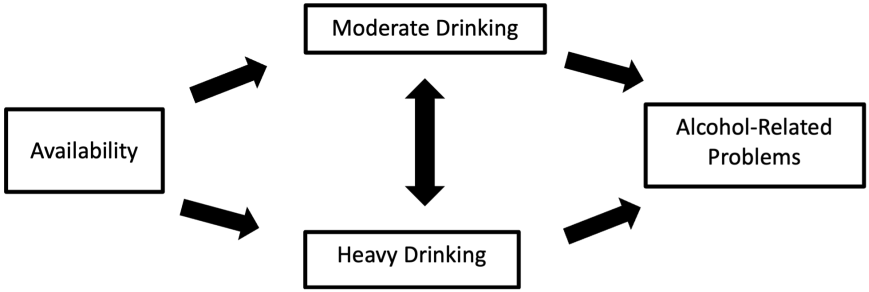
Availability Theory of Alcohol-Related Problems

The availability theory of alcohol-related problems, which I use as a theoretical lens in this study, was first mentioned in a 1980 World Health Organization (WHO) report developed by alcohol researchers (Stockwell & Gruenewald, 2004; WHO, 1980). This report was developed as a review of the ongoing empirical research surrounding alcohol-related harms. The theory proposed that access to alcohol leads to increased consumption, which leads to individual health impacts and other considerable environmental challenges (Stockwell et al., 2012). Figure 1 illustrates this theoretical model.

Alcohol access, or the availability of alcohol, is typically provided through venues where alcohol can be consumed on-site, or at venues where alcohol can be purchased and consumed off-site (Campbell et

Figure 1

Alcohol Availability Model



Adapted from Theories on alcoholism*, by C. Chaudron and D. Wilkinson (Eds.), 1988. Copyright 1988 by Addiction Research Foundation.*

al., 2009). On-premise outlets, which are common in cities with colleges/universities, are venues where alcohol can be purchased and consumed on-site, such as bars, nightclubs, or restaurants. Off-premise settings are locations where alcohol can be purchased and taken off-site for consumption, such as gas stations, liquor stores, or grocery stores (Campbell et al., 2009). Availability theory contends that an increase in availability will lead to reduced prices of alcohol through retail competition based on their close proximity, which could ultimately lead to increased alcohol consumption and more alcohol-related harms (Trangenstein, 2018). For the population of interest my study, previous studies have shown individual harms related to general college students and alcohol outlet availability (Connor et al., 2010; Kypri et al., 2008). However, I have found no studies looking specifically at the subpopulation of college students affiliated with fraternities and sororities. In this study I examined the following research questions.

Research Questions

- What is the relationship between alcohol consumption (measured through weekly binge drinking counts and AUDIT-C measures) and the proximity to alcohol outlets for college fraternity and sorority members at colleges/universities in the Southeastern Conference?
- In the same population, what is the relationship between alcohol consumption behaviors and the proximity of each type of alcohol outlet?

Method/Design

Setting

In this study I incorporated the following cities and states that hosted a Southeastern Conference (SEC) campus:

- Columbia, South Carolina (University of South Carolina)
- Baton Rouge, Louisiana (Louisiana State University)

- Columbia, Missouri (University of Missouri)
- Starkville, Mississippi (Mississippi State University)
- Oxford, Mississippi (University of Mississippi)
- Athens, Georgia (University of Georgia)
- Gainesville, Florida (University of Florida)
- Knoxville, Tennessee (University of Tennessee)
- Nashville, Tennessee (Vanderbilt University)
- Auburn, Alabama (Auburn University)
- Tuscaloosa, Alabama (University of Alabama)
- Lexington, Kentucky (University of Kentucky)
- Fayetteville, Arkansas (University of Arkansas)
- College Station, Texas (Texas A&M)

Campuses associated with the SEC were my setting of interest because these campuses have been associated with popular athletic programs rich in social cultures driven by their athletic popularity (Gates, 2022; Luckerson, 2013). I found that SEC schools are also typically associated with thriving fraternity and sorority systems, strong student enrollment, fraternity and sorority housing infrastructure, prominent football/athletic programs, social scenes, and business development catered to that campus population (Baer, 2020; Wuensch, 2015). These social scenes include bars, nightclubs, restaurants, and other types of outlets that serve alcohol, dependent on that state's alcohol laws (Baer, 2020).

Data Sources

Data for my study came from three primary areas: alcohol licensing records, survey responses, and residential locations of survey respondents.

Alcohol Licensing Records

I requested active records from each state's alcohol licensing agency between 2022 and 2023. In total, 6,694 alcohol outlets were included in the records requested. I transcribed records into a CSV file format and reviewed and coded license types as either on-premise, off-premise, or both based on license definitions provided by each state agency. Licenses associated with importers, wholesalers, distributors, caterers, and temporary events were removed from the dataset. I removed these licenses as they did not represent permanent physical locations where consumers would purchase alcohol for on- or off-premises consumption.

If an alcohol outlet had licenses for both types of services, it was classified as both an on- and off-premise outlet. I reviewed license files through conditional formatting to remove duplicate addresses. This was done because a business could have multiple licenses that all clas-

sify the same type of use relevant to the desired categories for this research. Files were then geocoded through ArcGIS/ArcMAP software.

Survey Data

For this study, I collected survey responses from an electronic survey conducted by Dyad Strategies. This company conducts university and organizational assessment projects every year to provide the client with data on the undergraduate student experience. The survey, which can be augmented based on the client's needs, can ask general demographic questions, health-related questions, culture/satisfaction questions, learning outcome questions, housing questions, and much more. This survey is completed by fraternity- and sorority-affiliated students across the nation every year, including the SEC. The data I used in this study included responses from SEC campuses during the 2022 calendar year. This timeframe better reflected when national and local operations for colleges and universities had more consistent post-pandemic, face-to-face operations. I selected this timeframe so that pandemic-related extraneous variables, such as business closures, state or city ordinances, restrictions on the sale of alcohol, and other public health policy measures, did not influence the outcome measures (Jackson et al., 2021). I cleaned the data so that it included only those respondents that stated in the survey that they either live in an on-campus residence hall or in their chapter's house (owned or rented).

In my study, I primarily used survey data responses from the respondents' demographics, the "Health_A_Binge" variable, also known as how many days per week the individual engaged in 5 or more alcohol drinks, and the "Health_A_USAUDIT-C" variable (referred to as the AUDIT-C variable), which incorporated a cumulative scoring of three questions centered around alcohol consumption behaviors in the past year. The AUDIT-C variable asks questions regarding how often an individual consumes alcohol each year, how many drinks they would have in a typical day, and how many days in the past year they consumed 5 or more drinks in one sitting. These two variables were selected because they gave a better description of problematic drinking behavior each week and an overall score for problematic drinking over the course of the year.

I present site characteristics for respondents in the study in Tables 1 and 2. These tables highlight a young (mostly freshmen and sophomores) and white population in the study. Given that most of my sample included freshmen and sophomores it would be easy to infer that most of the study sample included individuals that could not yet legally purchase or consume alcohol. This brings up an additional concern since individuals who are not of legal drinking age, in theory, should not be directly impacted by alcohol outlet access.

Residential Addresses

Because survey respondents did not provide an exact local address with their responses, I developed best-fit residential addresses for each

Table 1

Site Characteristics (Southeastern Conference West Campuses)

	Auburn	Baton Rouge	College Station	Fayetteville	Oxford	Starkville	Tuscaloosa
Grade level							
Freshmen	112	47	48	116	17	107	296
Sophomore	58	2	39	69	2	59	107
Junior	50	15	30	53	3	40	93
Senior	45	10	13	48	2	12	101
Fifth-year senior	4	1	1	1	0	1	1
Graduate student	2	0	0	0	0	1	2
New member	74	N/A	9	9	5	5	141
Race/ethnicity							
White	240	66	95	237	20	185	537
Asian/Pacific Islander	2	1	10	8	0	3	5
Black/African American	9	2	3	3	0	10	10
Hispanic/Latinx	3	0	12	16	0	5	11
American Indian/First Nation/Alaska Native	3	1	2	10	1	3	3
Two or more races	1	2	5	8	3	4	13
Middle Eastern/North African	3	1	0	0	0	1	1
Indian	3	0	2	0	0	0	2

Table 2

Site Characteristics (Southeastern Conference East Campuses)

	Athens	Columbia, SC	Columbia, MO	Gainesville	Knoxville	Lexington	Nashville
Grade level							
Freshmen	250	242	148	109	87	150	8
Sophomore	123	91	114	64	40	68	23
Junior	87	48	52	63	21	44	14
Senior	61	38	16	21	16	26	14
Fifth-year senior	2	0	1	3	2	0	0
Graduate student	1	0	0	2	1	1	0
New member	103	101	34	33	6	98	11
Race/ethnicity							
White	454	361	292	165	155	251	42
Asian/Pacific Islander	16	7	1	6	2	6	9
Black/African American	3	3	3	7	2	8	0
Hispanic/Latinx	16	17	11	32	3	8	3
American Indian/First Nation/Alaska Native	1	3	0	2	2	1	1
Two or more races	9	15	10	15	1	9	2
Middle Eastern/North African	0	0	1	3	0	1	0
Indian	6	3	0	1	0	0	1

respondent. This fit was required for me to create the proximity value used in the regression analysis. Initially, I cleaned the survey dataset to only include responses from individuals who stated that they either resided in a residence hall on campus or in the chapter-affiliated house. This resulted in my sample size of n = 3,663. I did this in order to identify the participant's residential address type in connection to the dependent variables. These two categorical responses did not provide exact addresses to geocode, so I had to find a solution.

For respondents who identified as living in a residence hall on campus, I assigned them all a central on-campus address, primarily because I was not able to determine their exact residence hall address. The residential location used for that group was the campus student union address connected to the student's home campus. This central location served as a best-fit solution for respondents in that subset of data, although there was a limitation in residential accuracy given the variability of residence hall locations on a typical college campus.

For respondents who identified as living in an on- or off-campus chapter-affiliated house, I conducted a public records/online search. In their demographic responses, each respondent provided their fraternity or sorority affiliation and the campus they attended. Through the demographics and a public records search, I was able to identify the physical address of the chapter house connected to that individual's fraternity or sorority affiliation. All student residential addresses were then loaded into a CSV file and geocoded through the ArcGIS/ArcMAP software toolbox.

Once all base layers were loaded, I used the ArcGIS/ArcMAP analysis toolbox to generate Near and Near Table measures (i.e., linear distances) between each residential location and each alcohol outlet. Through this analysis, I was able to determine the nearest alcohol outlet and its distance to each respondent's residential location, providing the independent variable for the analysis. Linear distances between locations were calculated in meters.

Proximity Analysis

In this study, I measured the relationship between weekly binge drinking and proximity to the nearest alcohol outlet through a negative binomial regression analysis. The model equation for this regression is best represented as the natural log of the expected value of binge drinking behavior (i.e., quantitative count variable) as a function of the proximity to the nearest alcohol outlet (i.e., quantitative variable). I measured the relationship between overall consumption behaviors, measured through a yearly consumption score (AUDIT-C), and the proximity to the nearest alcohol outlet with a correlational analysis.

Findings

Past studies indicate that alcohol outlet availability can be a problematic influence on alcohol consumption behaviors in a local population

(Connor et al., 2010; Dimova, 2023; Kypri et al., 2008; Paschall et al., 2012; Scribner et al., 2008; Stockwell et al., 2012). This influence can be equally problematic in college campus environments where alcohol misuse is a social norm (Dimova, 2023; Hollmann, 2002; Nuwer, 2001). However, my research in this study provided mixed findings on that association with fraternity and sorority subpopulations. The results of my study provided greater insight into the influence alcohol access, through proximity, may or may not have on certain populations. My study also provided greater insight into the range of alcohol availability at each institution.

I illustrate the drinking characteristics of each campus population and their associated alcohol outlet counts in Tables 3 and 4. The tables provide a breakdown of the number of alcohol outlets in a 3,200-meter radius of each campus. Tables are categorized as east or west Division campuses, consistent with the SEC structure.

In general, my study found statistically significant relationships between the variables of interest. However, these associations appeared to exist only with fraternity members and not sorority members. My findings were equally true when breaking down the independent variable to just on- and off-premise outlets versus all alcohol outlets. The relationship between weekly binge drinking behaviors and the proximity to alcohol outlets indicated that if a fraternity-affiliated man were to increase his distance from an alcohol outlet by 1 unit, he would decrease his binge drinking behaviors by a factor of 0.99 or 1%. The p values in my analysis for all alcohol outlet types, on-premise outlets, and off-premise outlets were less than .05. For sorority women, my analysis indicated alcohol outlet proximity did not have statistically significant associations with binge drinking behaviors.

When I examined the relationship between AUDIT-C drinking scores and the proximity to alcohol outlets, there were similar findings. The correlational analyses for fraternity men indicated weak and inverse relationships between the two variables. This means that as proximity (distance from one's residence to an alcohol outlet) increases then one's AUDIT-C score would decrease (improve). I found that sorority women showed positive and weak associations with all outlets and on-premise outlets. However, I found that none of the correlations involving sorority women were statistically significant.

While I found the associations to be statistically significant with fraternity men and not statistically significant with sorority women, it is important to note that the relationship between the two variables may also be influenced by other factors previously discussed, such as selection and socialization (Borsari et al., 2009; Larimer et al., 2000; McCabe et al., 2005, 2018). In tables 5, 6, and 7, I detail the regression statistics associated with binge drinking and proximity. Tables 8, 9, and 10 detail the correlational statistics for all respondents associated with AUDIT-C scoring and proximity. The results in the tables continue to indicate the previously noted relationships with both subpopulations.

Table 3

Drinking Characteristics by Site (Southeastern Conference East Campuses)

	Athens	Columbia, SC	Columbia, MO	Gainesville	Knoxville	Lexington	Nashville
All total alcohol outlets	224	235	153	187	123	262	411
On-premise alcohol outlets	170	184	127	135	111	214	382
Off-premise alcohol outlets	166	56	26	52	15	110	31
Campus mean binge drinking rate	0.82	1.03	1.01	0.95	0.86	0.66	0.52
Campus mean AUDIT-C	5.99	6.94	7.2	6.59	6.48	5.04	5.83

Table 4

Drinking Characteristics by Site (Southeastern Conference West Campuses)

	Auburn	Baton Rouge	College Station	Fayetteville	Oxford	Starkville	Tuscaloosa
All total alcohol outlets	104	129	180	147	74	44	173
On-premise alcohol outlets	73	87	136	123	62	36	137
Off-premise alcohol outlets	29	42	89	30	14	8	42
Campus mean binge drinking rate	0.63	1.33	0.88	0.76	1.04	0.61	0.64
Campus mean AUDIT-C	4.41	8.09	5.86	5.87	7.25	5.08	5.37

Table 5

Negative Binomial Regression Models Proximity & Binge Drinking (All Groups)

Alcohol outlets	β	p	IRR
All outlets	0.0001945	.07	1.000194
On-premise outlets	0.0001880	.07	1.000180
Off-premise outlets	-0.00002849	.73	0.999972

* *DENOTES A P VALUE LESS THAN .05.*

Table 6

Negative Binomial Regression Models Proximity & Binge Drinking (Fraternity)

Alcohol outlets	β	p	IRR
All outlets	-0.0002583*	.03	0.997417
On-premise outlets	-0.0002736*	.02	0.999726
Off-premise outlets	-0.0002231*	.02	0.999777

* *DENOTES A P VALUE LESS THAN .05.*

Table 7

Negative Binomial Regression Models Proximity & Binge Drinking (Sorority)

Alcohol outlets	β	p	IRR
All outlets	0.00000501	.98	1.000005
On-premise outlets	0.00004503	.82	1.000045
Off-premise outlets	-0.00008972	.50	0.999910

* *DENOTES A P VALUE LESS THAN .05.*

Table 8

Correlations Between Proximity & AUDIT-C (All Groups)

Alcohol outlets	r	p
All outlets	0.03	.11
On-premise outlets	0.05*	.05
Off-premise outlets	-0.03*	.05

Table 9

Correlations Between Proximity & AUDIT-C (Fraternity)

Alcohol outlets	r	p
All outlets	-0.07*	.02
On-premise outlets	-0.07*	.02
Off-premise outlets	-0.09*	.002

Table 10

Correlations Between Proximity & AUDIT-C (Sorority)

Alcohol outlets	r	p
All outlets	0.03	.18
On-premise outlets	0.04	.06
Off-premise outlets	-0.03	.09

My study's findings contradict those of a somewhat similar 2018 study, which examined proximity in relation to a range of alcohol-related harms including consumption (Seid et al, 2018). In my research study, significant associations were only found with fraternity men and not with sorority women. In contrast, Seid and colleagues only noted significant results in the relationship between proximity and alcohol harms with women. However, they found no associations between the proximity to outlets and consumption behaviors, including risky drinking. Some alcohol outlet studies have found significant results with one gender demographic over another (Halonen et al., 2013; Seid et al., 2018); whereas, my study showed some significant associations with a gender demographic not seen in other studies. Other studies have also examined the relationship between alcohol outlet proximity and drinking behaviors through different statistical analyses and found no significant associations between proximity and consumption behaviors (McKinney et al., 2012; Tanumihardjo et al., 2015). One interesting point from a 2015 study was that "proximity was not associated with binge drinking frequency, but excessive binge drinkers lived in areas with a higher density of alcohol outlets compared to those with non-binge drinkers" (Tanumihardjo et al., 2015, p. 146). This point brings up the question of whether the associations found in my study were a function of the proximity to the nearest outlet or whether individuals with high-risk consumption behaviors were moving to locations with easy access to alcohol. Given that my data set only included individuals who lived on-campus or in their chapter's affiliated housing, participants had a limited set of housing options to choose from in order to get closer alcohol outlet access. While some students may choose to live in either of the properties listed, more often than not, they are required to live on-campus or in their organization's house during the first few years of membership.

Discussion and Implications

The results of my study, in conjunction with all other attempts to address high-risk societal alcohol consumption, highlight the need to address alcohol access in college environments. To address this environmental concern, public health experts and fraternity and sorority professionals can use numerous community-based tools. The Substance Abuse and Mental Health Services Administration's (2019) strategic prevention framework offers a useful guide in addressing problems of substance use by giving a framework for community-

based prevention strategies. This framework takes the approach of assessment (i.e., identify the specific issues/needs), capacity building (i.e., collecting resources), planning (i.e., building a game plan), implementation (i.e., using evidence-based programs), and evaluation (i.e., constantly assessing the efficacy of your efforts).

Applying this framework, local fraternity and sorority professional staff, university staff, students, and alumni could begin influencing local policies and ordinances that address alcohol outlet density in their campus environment (Substance Abuse and Mental Health Services Administration, 2019). An example of such a policy approach is the restriction on the availability and density of alcohol sales in various commercial locations (Campbell et al., 2009). This is also known as a reduction in alcohol outlet density, or a reduction in the number of venues that can serve alcohol to the public (Campbell et al., 2009). The WHO identified "outlet density control as an effective method for reducing alcohol-related harms" (Campbell et al., 2009, p. 557). Policy and business advocacy through community coalitions has shown promising effects in many locations (Holder, 2000).

A relevant example of a community effort addressing alcohol-related harms in a college environment is from the University of South Carolina. Around 2018, the University of South Carolina, community stakeholders, and neighborhood associations attempted to address the negative effects of alcohol outlet density in their local entertainment district (Wilkinson, 2018). These groups filed numerous challenges regarding the renewal of alcohol licenses from identified problematic bars near campus. The university created metrics to identify and challenge businesses that they believed would "lure students – often underage students – with promise of cheap liquor and encourage them to drink to excess" (Wilkinson, 2018, p. 1). Through community action, they attempted to reduce the availability of alcohol and thus reduce alcohol-related harms.

Many campuses or cities have town-gown associations or coalitions that discuss and address issues in the community, including high-risk alcohol consumption (Linowski & DiFulvio, 2012). If one does not exist, then there is an opportunity to partner with external stakeholders and build one. Given the findings of my study, campus fraternity and sorority staff and house corporation volunteers should join these groups in order to build the capacity needed to address problems with alcohol access around their campuses and specifically around fraternity and sorority residences. The findings highlight a mediating variable around high-risk alcohol use often not addressed but relevant in risk reduction. These stakeholders have a responsibility to advocate for common sense business planning and limited alcohol outlet licensing in close proximity to campus, especially in their students' neighborhoods.

Limitations

As with any research study, several limitations impacted the results of my study, creating opportunities for future research. These limitations

and opportunities included the locations of the sample population, alcohol licenses incorporated, study design, environmental impacts not accounted for, different dependent variables that could be used, and incomplete data. As represented in Tables 3 and 4, there was a broad range of alcohol outlet volumes across each city, likely influenced by their unique city dynamics. Additionally, their populations and campus demographics were quite different across each city. Given this heterogeneous mixing of cities, done to account for all SEC institutions, future research could work to incorporate a more homogenous model of campuses and cities when conducting this analysis.

Comparing alcohol outlets presented an additional challenge since not all licenses for each state were similar and not all locations were popular venues, influencing consumption and other related harms (Livingston et al., 2007). For example, during the data collection portion of my study, determining whether a licensed outlet was an on- versus off-premise outlet was difficult due to fluctuating license definitions within each state. There were numerous examples where liquor stores or typical off-premise venues also had an on-premise outlet license so they could conduct tasting events and samples on-premises. Although this scenario could have been considered on-premises consumption, this type of venue does not have the same type of characteristics as typical on-premise venues such as a bar or restaurant. Additionally, not all venues attract the same level of business. Some businesses, or outlets, are huge drivers of traffic and alcohol consumption based on their popularity and business practices, and some businesses make most of their revenue from food sales rather than alcohol sales. These differences could impact their effect on community consumption rates. Future research in cities with colleges/universities should incorporate outlet alcohol sales as an additional variable. This data may be difficult to obtain depending on the state and location. However, this type of variable would help the researcher identify hot spot locations when it comes to alcohol sales that could influence consumption and alcohol-related harms.

Another limitation was that my study was an observational study of preexisting data, meaning a causal link between any of the results could not be proposed, but associations between variables of interest could be noted (Schonlau et al., 2008). Creating a true experiment in this type of study would have been difficult. A researcher cannot easily change the number of alcohol outlets that exist in a particular location or their distance from certain respondents. Those types of changes can be unpredictable and usually occur because of various environmental factors.

I would recommend that future research explore other alcohol-related behaviors and harms in relationship to similar independent variables. My study looked only at self-reported binge drinking behaviors each week and current alcohol consumption behaviors (AUDIT-C). Other alcohol availability studies have explored other types of alcohol consumption behaviors that may be of interest (Livingston et al., 2007).

These could include self-reported harms that come from drinking behaviors such as academic impacts, physical and psychological injuries, relationship issues, sexually transmitted diseases, drinking and driving arrests and incidents, assaults, and motor vehicle accidents (Livingston et al., 2007).

Another limitation and opportunity was that because the survey did not ask for the exact home address information from each respondent, the sample size was decreased and augmented for an approximate fit. Since the data set only included respondents who stated they lived on-campus or in their chapter's fraternity/sorority house, the individuals who stated they lived in a residence hall on campus were all given an estimated centralized location (i.e. university union address). Providing this generalized location for some of the respondents was an attempt to include more responses in the regression analysis. However, given the fact that students can live in multiple residences spread throughout the city, providing a uniform address for all of them would not perfectly reflect their exact proximity to an alcohol outlet. Future studies could include individual residential addresses in their list of demographic questions to improve the accuracy of the analyses.

Another limitation is that data from respondents did not incorporate their legal age or ability to consume/possess alcohol. Given that much of the data set was young freshmen and/or sophomores, it would be easy to infer that most of the respondents were under the legal drinking age. However, it would be helpful to capture that detail in future datasets. There may be a difference in associations between alcohol outlets' proximity and drinking behaviors with members under 21 years of age versus members 21 years and older. However, without that data, we can only make assumptions. Future studies could include this information and compare statistical differences in these two subsets.

Conclusion

Overall, my research study found a statistically significant relationship associated with fraternity binge drinking and general alcohol consumption behaviors and the proximity to alcohol outlets from a person's residence. However, I found no statistically significant associations with sorority membership. These mixed findings reinforce the variability of associations between alcohol outlet proximity and drinking behaviors found in the research (Chen et al., 2010; Kuntsche et al., 2008; Truong & Sturm, 2009). My research findings validate concerns about harmful health behaviors and nearby access to alcohol, especially with college students known to engage in high-risk alcohol use (Capone et al., 2007; DeSimone, 2009; McCreary et al., 2021; Nuwer, 2001; Patrick et al., 2022; Ragsdale et al., 2012; Ranker & Lipson, 2022; Routon & Walker, 2014).

Access to alcohol influences drinking behaviors, but the degree of that relationship can vary based on numerous variables. More research is needed to fully understand this impact on college-aged adults who are the most at risk for severe alcohol-related behaviors, harms, and

consequences. Many college-aged adult groups could be incorporated into this type of study, but fraternity/sorority-affiliated students provide a group with historically concerning relationships with alcohol (Capone et al., 2007; DeSimone, 2009; McCreary et al., 2021; Nuwer, 2001; Patrick et al., 2022; Ragsdale et al., 2012; Ranker & Lipson, 2022; Routon & Walker, 2014).

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