Investigation into Student Alcohol Use and its Effect on Town-Gown Relationships

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Abstract

In the fall of 2017, Miami University conducted a web survey called the Optimal College Town Assessment. The purpose of the survey was to study the relationship between people affiliated with Miami University and members of the Oxford community. The central goals in analyzing the data are to determine if student partying has a negative influence on this relationship and to observe if the survey suggests ways in which the relationship could be improved.

In order to accomplish this, the responses of university students and staff were compared to the responses of community members with respect to the questions of the survey that addressed student drinking. People affiliated with the college and community members are in agreement that student partying is most likely to occur on Thursdays, Fridays, and Saturdays. Students and staff think the two problems associated with student partying that occur most often are littering and sexual assault, while community members believe that littering and excessive noise are the most common. Also, it was found that there is not a sizable relationship between community members' perceptions of student partying and their perspectives on other aspects of the relationship between the town and the college. The results of the analysis suggest that student drinking is seen as having a negative impact on the community in a variety of ways.

Introduction

This dataset contains the results of a survey administered by Miami University funded by a competitive grant from the Ohio Prevention Action Alliance. The Optimal College Town Assessment [1] is a survey tool designed to gauge the quality of the relationship between a university and its host community. The goal of the survey is to measure the strength of this relationship or to expose particular areas where the quality of the relationship has eroded.

The survey was completed in the Fall of 2017 and was taken online, allowing one submission per IP address to reduce the chance that any individual could take the survey multiple times. As a participant answered the survey, it branched into two different versions of the survey based on two main categories: Campus Members, including students, faculty, staff, etc., and Community Members, including elected officials, local business professionals, etc. A comprehensive campaign to encourage response was coordinated by the Town-Gown Initiatives Team.

The survey consists of both open-ended questions and multiple choice questions, most of which were answered on a scale from 1 to 5. The beginning of the survey serves as a baseline assessment of the perceptions of campus representatives -- students, faculty, administrative leaders, staff, board of trustees -- and various stakeholders in the community -- business and industry leaders, local school district teachers and

administrators, members of the local clergy, directors of non-profit organizations and the like [1]. Community members were asked about their contact and relationships with groups of people on campus [10] and, conversely, campus members were asked about their contact and relationships with people of the community [11]. Survey participants were also asked to rank their community involvement as a whole. Participants were also asked questions about how drinking specifically affects the community as well as more general questions about the relationship between the college and the community. The OCTA then produced an evaluation of how that individual participant fits within the community [1]. This evaluation is only received for those that completed the survey in its entirety. The four categories for this evaluation are as follows:

1. Harmonious - the most desirable of town-gown relationships, a harmonious relationship has partners dynamically involved in a significant number of activities that are of shared benefit to campus and community.

2. Traditional - this can be thought of as the default state of affairs between most campus and communities; it generates modest amounts of relationship satisfaction.

3. Conflicted - the conflicted type generates an overall reduced satisfaction level, but partners are still engaged with one another in an attempt to work out relationship issues.

4. Devitalized - the last of the four categories, the devitalized type represents relationships with the least amount of overall satisfaction between campus and community members. Most often, there is a feeling of disappointment and loss, stemming from the fact that a more active and comfortable association had existed at some point in the past.

The main goal of the project involves analyzing the means of the survey responses; this includes computing the means of the survey responses overall, the means of Miami University groups overall, the means of the Oxford community overall, and the means of the individual groups within Miami University and the Oxford Community. These larger and smaller group means are then compared to one another to find significant differences among them. More specifically, these means are used to analyze if the individual groups had different perceptions or rankings of the most problematic elements of student drinking, the most problematic drinking nights, and the most problematic locations of drinking. Additionally, the survey responses to many of these questions are then referenced against each other to determine if perceptions that student partying is a problem in the Oxford community were correlated with the community perspectives on other campus concerns. Lastly, our results from these analyses are used to determine if the data provided any insight into how to improve the university-community relations, if student alcohol use appeared to have a negative impact on town-gown relations, and if the university seemed to recognize/understand this.

Methods

The R Programming Language [6] was used in all portions of the analysis by way of the RStudio integrated development environment [8]. The R package tidyverse was used for some of the data cleaning [13]. All plots were made with the R package ggplot2 [14].

Exploratory Data Analysis

The results of the survey were first studied in an exploratory data analysis. As part of this exploratory analysis, the survey responses from the community and the campus were analyzed separately. This was done with the intention of obtaining comparable average responses for each group within the Oxford community and Miami University campus.

Approximately 1,000 community members took the survey. Among community members, the groups that claimed to have the best relationships with the students were the local government members and business owners. Non-elected government members and local school workers reported the lowest rated relationships with Miami students, around a full point lower than the top groups. Another interesting takeaway from the exploratory analysis was that each group, regardless of the strength of their personal relationship, believed that their individual relationship with students was better than the relationship between the students and the community as a whole.

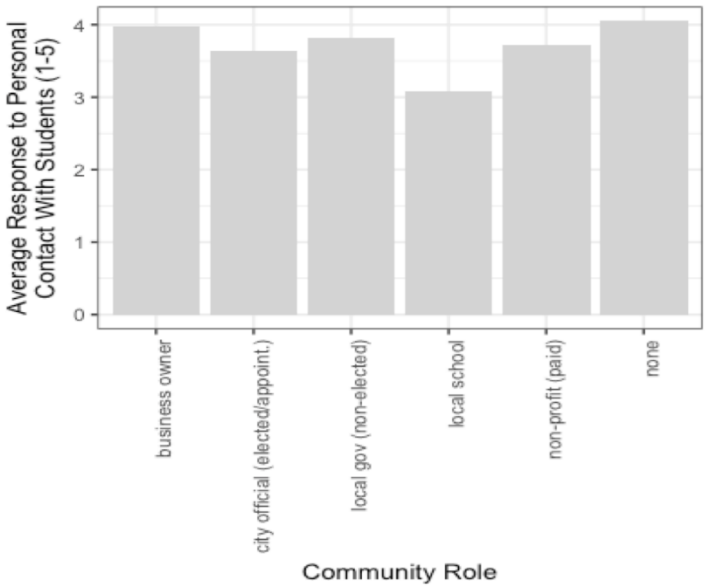

Figure 1: Community Role Means of Personal Contact with Students

As seen above in Figure 1, each of the different groups within the Oxford community express a similar level of interaction with Miami University. Local school members are the one group that felt they had slightly less contact with Miami University people than the other community groups did.

Around 1,300 people affiliated with Miami University completed the survey in whole or in part. About half of the responses came from current students. The rest of the responses were mostly from faculty, administrators, and other staff. Answers to most of the questions in the survey showed a variety of opinions among respondents, although there are a few exceptions. For instance, there appears to be a consensus that there is little partying on Mondays and more on Fridays and Saturdays.

This preliminary analysis implied that while the ideal campus/community relationship is harmonious, most participants considered themselves in a more traditional relationship. Most participants found that while their own particular involvement with the community was pretty high, the average for the town overall was a decent margin lower. The following objectives provide a more detailed analysis of how the previously introduced goals were addressed.

Objective 1

In order to determine the negative impact that student drinking has on town-gown relations, three sections of the survey were analyzed. These sections include 1) rating how much trouble is caused in the community by students partying in certain locations 2) indicating how calm or wild each night of the week is in terms of student partying and 3) rating how often certain problems occur in the community as a result of student partying. Using the responses to these questions, means were computed across the various subgroups of survey participants. The goal in comparing these means is to identify potential areas where the feelings of the Miami University campus and the Oxford community differ. Once the differences in the campus and community views are identified, campus representatives can create a plan to patch these differences and improve the campus/community relationship.

When comparing the various means, it is of interest to understand which group means have differences that are statistically significant. To determine this, two sample t-tests were used to test the differences between the campus and community mean responses (entire campus vs. entire community, subgroups were not considered during this part of the analysis) [9]. A widely recognized rule of thumb was utilized in deciding which t-test to use. If the ratio of the variances for the two groups was greater than three, it was concluded there was unequal variance, otherwise the analysis proceeded under the assumption of equal variance. Given the decision regarding the assumption of equal variances, the appropriate test was selected.

Along with the means, standard deviations, and t-tests, several graphics were created to show the differences between various groups. These graphics are intended to quickly point out some of the differences and to visually display their magnitude; for a more detailed break down, please refer to the tables that accompany them.

Objective 2

To determine if there is a correlation between the perception that student partying is a problem and perspectives among community members on other campus-community issues, Pearson's correlation coefficients between various partying specific concerns and other concerns were found [3]. If a participant had responded "Don't know" to a question, their response was not used in analysis for that question. The responses of community members to the following questions were used for this part of the data analysis:

Partying specific concerns

- To what extent has student partying put strain on campus-community ("town/gown") relationships?
- Thinking about potential problems related to student partying, please rate how often these problems seem to occur in your community . . .
    - Excessive Noise
    - Trash/Littering
    - Violence/fights/riots
    - Public urination
    - Sexual assault
    - Vandalism
    - Traffic accidents/DUIs
    - Injuries due to falls or crowds

Other concerns

- Level of agreement or disagreement with the following statements:
    - There are not enough events on campus that interest me. (Q1)
    - Coursework offered on campus is too expensive. (Q2)
    - The campus seems difficult to get to. (Q3)
    - Not enough classes and degrees are offered on the campus. (Q4)
    - Campus representatives do not readily share their expertise with the community. (Q5)
    - Campus representatives are not well connected to the local school districts. (Q6)
    - It's hard to know what's happening on campus. (Q7)
    - People from the campus don't live in our community. (Q8)
    - The campus does not contribute as much as it could to the local economy. (Q9)
    - People from the campus do not get involved in volunteer efforts in the community. (Q10)
    - Campus representatives are not very visible at community events. (Q11)
    - Student misbehavior in the community is a real problem. (Q12)

To further look at potential correlation, linear regression was performed with the responses to "To what extent has student partying put strain on campus-community ("town/gown") relationships?" as the response variable and the responses on matters not relating to student partying as predictors [12]. The assumptions in linear regression are linearity, independence, normality, and constant variance [5]. Akaike's information criterion (AIC) was used in backward selection [4]. The MASS package was used for model selection [7]. The car package was used to check variance inflation factors [2].

Results & Conclusions

Objective 1

The Oxford community and the Miami University campus seems to be mostly in agreement in regards to how wild/calm each night of the week is in terms of student partying.

	Problematic Drinking Nights							
		Miami University						
Night	Survey Average (2,321)	Current Student (661)	Faculty Member (222)	Administrator/ Staff Member (382)	Member of the Governing Board of this Campus (1)	Active Alumnus (4)	None of the Above (24)	Campus Average (1,301)
Monday	1.53 (0.78) 7	1.45 (0.70) 7	1.58 (0.90) 7	1.60 (0.79) 7	1.00 (NA) 6	3.00 (2.83) 2	1.85 (0.90) 6	1.53 (0.78) 7
Tuesday	2.11 (1.14) 5	2.68 (1.17) 4	1.78 (1.05) 6	1.88 (1.03) 6	1.00 (NA) 6	2.50 (2.12) 6	1.00 (1.08) 7	2.27 (1.18) 4
Wednesday	2.16 (0.94) 4	2.16 (0.88) 5	2.30 (1.05) 4	2.16 (0.91) 5	3.00 (NA) 4	3.50 (2.12) 1	2.23 (0.93) 4	2.19 (0.93) 5
Thursday	3.88 (1.01) 3	3.98 (0.94) 3	3.93 (1.02) 3	3.84 (1.02) 3	5.00 (NA) 1	2.50 (2.12) 6	3.54 (1.13) 3	3.92 (0.99) 3
Friday	4.61 (0.74) 1	4.71 (0.63) 1	4.54 (0.81) 1	4.54 (0.76) 2	5.00 (NA) 1	3.00 (2.83) 2	4.15 (1.21) 2	4.62 (0.73) 1
Saturday	4.63 (0.75) 2	4.68 (0.69) 2	4.53 (0.89) 2	4.59 (0.74) 1	5.00 (NA) 1	3.00 (2.83) 2	4.31 (1.18) 1	4.62 (0.76) 1
Sunday	2.05 (1.11) 6	1.59 (0.98) 6	2.25 (1.12) 5	2.35 (1.09) 4	3.00 (NA) 4	3.00 (2.83) 2	2.23 (1.30) 4	1.95 (1.11) 6
Overall	3.00 (0.59)	3.04 (0.51)	2.99 (0.67)	2.99 (0.61)	3.29 (NA)	2.93 (0.30)	2.90 (0.85)	3.01 (0.58)

Table 1: *Miami University Mean Responses for Problematic Drinking Nights*

Problematic Drinking Nights									
		Oxford Community							
Night	Survey Average (2,321)	Business Owner (71)	Clergy Member (3)	Elected/ Appointed City Official (15)	Non-elected Employee of Local Government (48)	Teacher/ Administrator in a Local School District (65)	Paid Employee of a Non-profit Agency (90)	None of the Above (689)	Community Average (1,020)
Monday	1.53 (0.78) 7	1.41 (0.75) 7	3.00 (2.00) 6	1.20 (0.41) 7	1.86 (0.98) 7	1.62 (0.80) 7	1.58 (0.76) 7	1.51 (0.77) 7	1.53 (0.79) 7
Tuesday	2.11 (1.14) 5	1.51 (0.80) 6	3.00 (2.00) 6	1.53 (0.83) 6	2.32 (1.12) 5	1.77 (0.96) 6	1.77 (0.96) 6	1.95 (1.07) 6	1.90 (1.04) 6
Wednesday	2.16 (0.94) 4	1.98 (0.96) 5	3.67 (1.15) 4	2.13 (1.19) 4	2.50 (0.98) 4	2.17 (0.96) 5	2.11 (0.92) 5	2.09 (0.95) 5	2.12 (0.96) 5
Thursday	3.88 (1.01) 3	3.51 (1.16) 3	4.33 (1.15) 1	4.07 (0.70) 3	4.16 (0.75) 3	3.72 (1.06) 3	3.84 (0.97) 3	3.84 (1.03) 3	3.83 (1.02) 3
Friday	4.61 (0.74) 1	4.32 (1.03) 2	4.33 (1.15) 1	4.73 (0.59) 2	4.75 (0.53) 2	4.53 (0.79) 2	4.63 (0.68) 2	4.61 (0.71) 2	4.59 (0.74) 2
Saturday	4.63 (0.75) 2	4.33 (1.09) 1	4.33 (1.15) 1	4.80 (0.41) 1	4.84 (0.37) 1	4.65 (0.68) 1	4.67 (0.65) 1	4.65 (0.71) 1	4.64 (0.73) 1
Sunday	2.05 (1.11) 6	2.02 (1.02) 4	3.67 (1.15) 4	2.13 (0.92) 4	2.18 (1.19) 6	2.30 (1.00) 4	2.23 (1.11) 4	2.18 (1.11) 4	2.19 (1.10) 4
Overall	3.00 (0.59)	2.73 (0.71)	3.76 (1.08)	2.94 (0.40)	3.23 (0.58)	2.96 (0.63)	2.98 (0.57)	2.98 (0.58)	2.97 (0.60)

***Table 2**: Oxford Community Mean Responses for Problematic Drinking Nights*

As you can see in Table 1 and Table 2, the rank of each night remains relatively consistent between the campus and community as well as between each of the sub groups. It is evident that the community views Thursday through Saturday as problematic. However, despite being a possible strain on the town-gown relationship, the campus seems to already recognize this issue as they have also highly ranked these nights. The t-test results for each night are shown in Table 3.

T-Test Results for Problematic Drinking Nights							
	Campus Average	Community Average	Observed Difference	Test Statistic	P-Value	95% CI for Difference in Means	Ratio of Variance
Monday	1.53	1.53	0.00	-0.19	0.85	(-0.08, 0.07)	0.96
Tuesday	**2.27**	**1.90**	**0.37**	**6.96**	**<0.01**	**(0.27, 0.48)**	**1.29**
Wednesday	2.19	2.12	0.07	1.47	0.14	(-0.02, 0.15)	0.93
Thursday	3.92	3.83	0.09	1.93	0.05	(-0.002, 0.19)	0.94
Friday	4.62	4.59	0.03	0.77	0.44	(-0.04, 0.10)	0.98
Saturday	4.62	4.64	-0.02	-0.54	0.59	(-0.09, 0.05)	1.09
Sunday	**1.95**	**2.19**	**-0.24**	**-4.59**	**<0.01**	**(-0.34, -0.14)**	**1.02**

***Table 3:** T-Test Results for Problematic Drinking Nights*

The t-test results confirms that the campus recognizes the weekends as highly problematic since the difference between the campus and community averages was found to be insignificant. The only nights in which the campus and community had a statistically significant difference of opinion on how wild or calm student partying is are Tuesday and Sunday nights. However, despite the significant difference, both the campus and community rated both of these nights at or below 2.27 on average. Considering the low averages, this is likely not a large contributor to the strain in the

town-gown relationship. Figure 2 shows the significant gap between the weekend and weekday ratings for both community and campus.

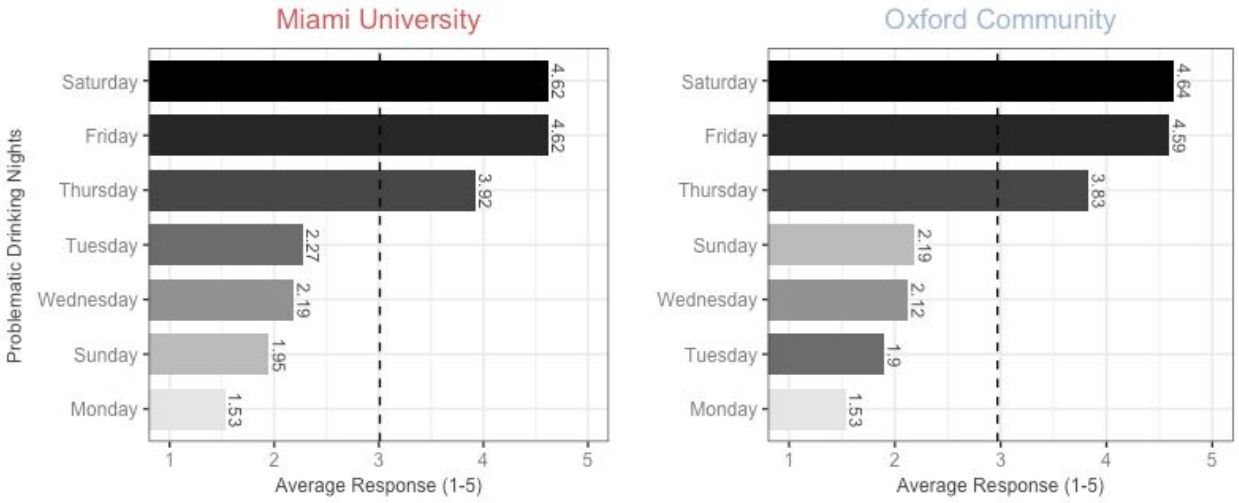

Figure 2: *Miami University and Oxford Community Mean Responses for Problematic Drinking Nights.*

**Shade represents magnitude for the Miami University rankings and remains consistent between nights when switching to the Oxford Community for ease of comparison.*
***The dashed vertical lines represent the campus and community averages for all nights combined on the respective plots.*

Figure 2 again supports the idea that there is a noticable difference between the rankings of Thursday through Saturday nights and the rankings for the rest of the nights of the week.

There seems to be more discrepancy in the averages between the campus and the community in regards to the problematic drinking locations. Table 4 shows that campus and the community had significantly different average ratings on four of the six problematic drinking locations included in the survey.

T-Test Results for Problematic Drinking Locations							
	Campus Average	Community Mean	Observed Difference	Test Statistic	P-Value	95% CI for Difference in Means	Ratio of Variance
Private Residences	**3.11**	**3.34**	**-0.23**	**-4.42**	**<0.01**	**(-0.34, -0.13)**	**0.99**
Fraternity Houses	3.68	3.61	0.07	1.25	0.21	(-0.04, 0.17)	0.97
Bars, Taverns, and Nightclubs	**3.55**	**3.67**	**-0.12**	**-2.16**	**0.03**	**(-0.22, -0.01)**	**1.10**
Restaurants	**2.14**	**2.28**	**-0.14**	**-3.20**	**<0.01**	**(-0.23, -0.06)**	**0.92**
On-Campus Residence Halls	**2.46**	**2.24**	**0.22**	**4.65**	**<0.01**	**(0.12, 0.30)**	**1.07**
Stadium, Arena, or Tailgate Parties	2.10	2.15	-0.05	-1.17	0.24	(-0.14, 0.04)	0.92

Table 4: *T-Test Results for Problematic Drinking Locations*

Problematic Locations of Drinking								
		Miami University						
Location	Survey Average (2,321)	Current Student (661)	Faculty Member (222)	Administrator/ Staff Member (382)	Member of the Governing Board of this Campus (1)	Active Alumnus (4)	None of the Above (24)	Campus Average (1,301)
Private Residences	3.21 (1.14) 3	2.67 (1.05) 3	3.58 (1.10) 3	3.54 (0.99) 3	5.00 (NA) 1	1.67 (1.15) 3	3.46 (1.05) 3	3.11 (1.13) 3
Fraternity Houses	3.65 (1.14) 1	3.46 (1.19) 1	4.02 (1.08) 1	3.84 (1.01) 1	5.00 (NA) 1	2.67 (1.53) 2	3.62 (0.77) 1	3.68 (1.13) 1
Bars, Taverns, and	3.61 (1.14) 2	3.25 (1.16) 2	3.93 (1.08) 2	3.84 (1.07) 1	5.00 (NA) 1	1.33 (0.58) 4	3.54 (1.27) 2	3.55 (1.17) 2
Restaurants	2.20 (0.97) 5	1.92 (0.91) 5	2.37 (1.01) 6	2.35 (0.92) 5	3.00 (NA) 4	1.33 (0.58) 4	2.23 (0.93) 5	2.14 (0.95) 5
On-Campus Residence Halls	2.36 (0.98) 4	2.30 (0.99) 4	2.68 (1.10) 4	2.56 (0.88) 4	2.00 (NA) 5	3.33 (1.53) 1	2.62 (1.19) 4	2.46 (0.99) 4
Stadium, Arena, or Tailgate	2.12 (0.99) 6	1.87 (0.88) 6	2.43 (1.04) 5	2.26 (0.97) 6	2.00 (NA) 5	1.33 (0.58) 4	2.62 (1.26) 4	2.10 (0.97) 6
Overall	2.86 (0.78)	2.58 (0.76)	3.16 (0.79)	3.07 (0.68)	3.67 (NA)	1.94 (0.48)	3.01 (0.83)	2.84 (0.79)

Table 5: *Miami University Mean Responses for Problematic Drinking Locations*

Problematic Locations of Drinking									
		Oxford Community							
Location	Survey Average (2,321)	Business Owner (71)	Clergy Member (3)	Elected/ Appointed City Official (15)	Non-elected Employee of Local Government (48)	Teacher/ Administrator in a Local School District (65)	Paid Employee of a Non-profit Agency (90)	None of the Above (689)	Community Average (1,020)
Private Residences	3.21 (1.14) 3	3.17 (1.17) 3	4.33 (1.15) 1	3.67 (0.98) 3	3.62 (0.90) 3	3.65 (1.03) 3	3.40 (1.06) 3	3.28 (1.17) 3	3.34 (1.14) 3
Fraternity Houses	3.65 (1.14) 1	3.23 (1.25) 2	3.00 (2.00) 5	3.93 (1.10) 2	3.83 (1.13) 2	3.82 (1.06) 2	3.67 (0.97) 2	3.60 (1.16) 2	3.61 (1.15) 2
Bars, Taverns, and Restaurants	3.61 (1.14) 2	3.28 (1.28) 1	4.33 (1.15) 1	4.07 (0.59) 1	4.09 (0.88) 1	3.85 (0.97) 1	3.81 (1.01) 1	3.62 (1.13) 1	3.67 (1.11) 1
	2.20 (0.97) 5	2.11 (0.90) 4	4.00 (1.00) 3	2.27 (1.03) 4	2.45 (0.77) 5	2.48 (0.88) 4	2.42 (1.04) 4	2.24 (1.01) 4	2.28 (0.99) 4
On-Campus Residence Halls	2.36 (0.98) 4	2.02 (0.87) 5	3.67 (0.58) 4	2.00 (0.76) 6	2.51 (1.02) 4	2.23 (0.84) 6	2.31 (0.93) 6	2.24 (0.98) 4	2.24 (0.96) 5
Stadium, Arena, or Tailgate	2.12 (0.99) 6	1.95 (0.98) 6	3.00 (2.00) 5	2.07 (0.88) 5	2.19 (0.99) 6	2.26 (1.01) 5	2.42 (1.20) 4	2.12 (0.98) 6	2.15 (1.01) 6
Overall	2.86 (0.78)	2.63 (0.70)	3.72 (0.86)	3.00 (0.36)	3.11 (0.66)	3.05 (0.64)	3.00 (0.75)	2.85 (0.79)	2.88 (0.77)

Table 6: *Oxford Community Mean Responses for Problematic Drinking Locations*

Table 4 shows that there are significant differences for private residences, bars, restaurants, and on-campus residence halls. Although these locations are significantly different in the average ranking, Tables 5 and 6 show that the ranking remains mainly consistent between the university and the community. This indicates that the community may be consistently rating the locations higher across the board.

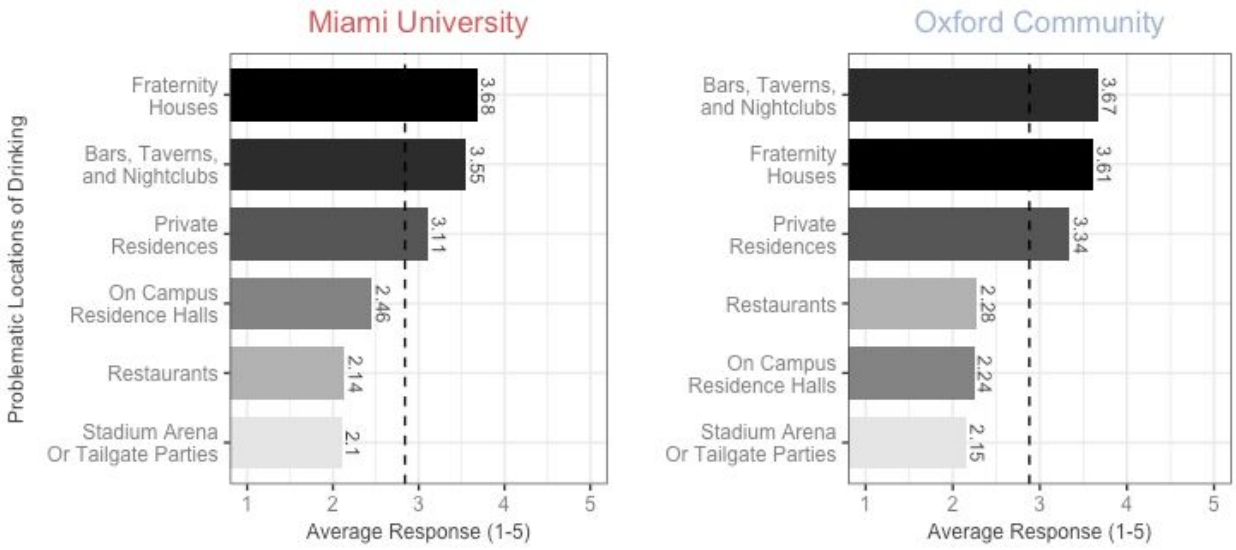

Figure 3: *Miami University and Oxford Community Mean Responses for Problematic Drinking Locations*

According to both university-affiliated respondents and community members, the top two locations for student partying are fraternity houses and bars, taverns, and nightclubs (Figure 3).

The most interesting portion of the survey dealt with problematic behavior associated with student drinking. With the exception of excessive noise, the campus and community had significantly different average rankings for each of the elements included in the survey. Even though excessive noise was found to have an insignificant difference, it was still rated highly for both campus and community (3 and 2, respectively). Tables 7 through 8 outline the results for the problematic drinking elements.

Problematic Elements of Student Drinking								
		Miami University						
Element	Survey Average (2,321)	Current Student (661)	Faculty Member (222)	Administrator/ Staff Member (382)	Member of the Governing Board of this Campus (1)	Active Alumnus (4)	None of the Above (24)	Campus Average (1,301)
Excessive Noise	3.46 (0.97) 2	3.35 (1.00) 3	3.53 (0.97) 2	3.48 (0.98) 2	5.00 (NA) 1	2.00 (1.41) 4	3.45 (1.51) 2	3.42 (1.00) 3
Trash/ Littering	4.02 (1.01) 1	3.81 (0.99) 1	4.11 (1.04) 1	4.05 (1.03) 1	5.00 (NA) 1	2.50 (2.12) 2	3.82 (1.40) 1	3.93 (1.03) 1
Violence/ Fights/ Riots	2.73 (0.93) 8	2.43 (0.79) 7	2.95 (1.00) 8	2.79 (0.92) 8	4.00 (NA) 3	2.00 (1.41) 4	2.91 (1.38) 4	2.64 (0.91) 6
Public Urination	3.2 (1.13) 4	2.95 (1.08) 4	3.21 (1.15) 4	3.40 (1.16) 4	4.00 (NA) 3	3.00 (2.83) 1	3.18 (1.47) 3	3.13 (1.14) 4
Sexual Assault	3.42 (1.01) 3	3.58 (0.93) 2	3.52 (1.14) 3	3.47 (1.02) 3	4.00 (NA) 3	1.50 (0.71) 7	2.91 (1.38) 4	3.52 (1.00) 2
Vandalism	3.09 (1.01) 5	2.74 (0.91) 5	3.18 (1.02) 5	3.21 (1.02) 5	4.00 (NA) 3	1.50 (0.71) 7	2.64 (1.12) 7	2.96 (0.99) 5
Traffic Accidents/ DUI	2.87 (0.94) 7	2.43 (0.83) 7	3.14 (0.97) 6	3.02 (0.89) 6	4.00 (NA) 3	2.50 (0.71) 2	2.82 (1.17) 6	2.74 (0.94) 7
Injuries Due To Falls or Crowds	2.94 (1.02) 6	2.73 (0.97) 6	3.05 (1.00) 7	3.01 (1.00) 7	4.00 (NA) 3	2.00 (0.00) 4	2.73 (1.19) 8	2.87 (1.00) 6
Overall	3.22 (0.77)	3.00 (0.65)	3.33 (0.84)	3.30 (0.82)	4.25 (NA)	2.13 (1.06)	3.06 (1.19)	3.15 (0.76)

Table 7: *Miami University Mean Responses for Problematic Drinking Elements*

Problematic Elements of Student Drinking									
		Oxford Community							
Element	Survey Average (2,321)	Business Owner (71)	Clergy Member (3)	Elected/ Appointed City Official (15)	Non-elected Employee of Local Government (48)	Teacher/ Administrator in a Local School District (65)	Paid Employee of a Non-profit Agency (90)	None of the Above (689)	Community Average (1,020)
Excessive Noise	3.46 (0.97) 2	3.19 (0.88) 3	3.33 (0.58) 2	3.87 (0.52) 4	3.84 (0.95) 2	3.67 (0.87) 3	3.47 (0.88) 2	3.45 (0.96) 2	3.48 (0.94) 2
Trash/ Littering	4.02 (1.01) 1	3.98 (1.03) 1	4.33 (1.15) 1	4.67 (0.49) 1	4.35 (0.81) 1	4.41 (0.73) 1	4.24 (0.90) 1	4.08 (1.03) 1	4.14 (0.98) 1
Violence/ Fights/ Riots	2.73 (0.93) 8	2.50 (0.94) 8	3.00 (1.00) 7	3.33 (0.62) 7	3.44 (1.01) 5	3.10 (0.74) 8	2.97 (0.95) 8	2.78 (0.93) 8	2.85 (0.94) 8
Public Urination	3.2 (1.13) 4	3.13 (1.19) 4	3.33 (0.58) 2	4.00 (0.53) 2	3.77 (1.17) 3	3.69 (0.88) 2	3.35 (1.00) 4	3.18 (1.13) 4	3.28 (1.12) 4
Sexual Assault	3.42 (1.01) 3	2.92 (1.06) 5	3.00 (1.00) 7	3.60 (0.74) 5	3.16 (0.97) 7	3.47 (0.71) 5	3.23 (0.95) 6	3.33 (1.02) 3	3.29 (0.99) 3
Vandalism	3.09 (1.01) 5	3.21 (0.89) 2	3.33 (0.58) 2	4.00 (0.85) 2	3.77 (1.09) 3	3.64 (0.74) 4	3.40 (0.96) 3	3.13 (1.02) 5	3.26 (1.01) 5
Traffic Accidents/ DUI	2.87 (0.94) 7	2.85 (0.94) 6	3.33 (0.58) 2	3.33 (0.62) 7	3.16 (0.95) 7	3.22 (0.82) 7	3.17 (0.81) 7	3.00 (0.96) 6	3.04 (0.93) 6
Injuries Due To Falls or Crowds	2.94 (1.02) 6	2.68 (1.02) 7	3.33 (0.58) 2	3.47 (0.74) 6	3.33 (1.15) 6	3.29 (0.88) 6	3.31 (1.07) 5	2.97 (1.03) 7	3.04 (1.04) 6
Overall	3.22 (0.77)	3.06 (0.77)	3.38 (0.54)	3.78 (0.41)	3.60 (0.82)	3.56 (0.59)	3.39 (0.73)	3.24 (0.78)	3.30 (0.77)

Table 8: *Oxford Community Mean Responses for Problematic Drinking Elements*

T-Test Results for Problematic Drinking Elements							
	Campus Average	Community Mean	Observed Difference	Test Statistic	P-Value	95% CI for Difference in Means	Ratio of Variance
Excessive Noise	3.42	3.48	-0.06	-1.31	0.19	(-0.15, 0.03)	1.13
Trash/ Littering	**3.93**	**4.14**	**-0.21**	**-4.33**	**<0.01**	**(-0.31, -0.12)**	**1.10**
Violence/ Fights/ Riots	**2.64**	**2.85**	**-0.21**	**-4.86**	**<0.01**	**(-0.31, -0.13)**	**0.93**
Public Urination	**3.13**	**3.28**	**-0.15**	**-2.75**	**<0.01**	**(-0.26, -0.04)**	**1.04**
Sexual Assault	**3.52**	**3.29**	**0.23**	**4.74**	**<0.01**	**(0.13, 0.32)**	**1.03**
Vandalism	**2.96**	**3.26**	**-0.30**	**-6.14**	**<0.01**	**(-0.39, -0.20)**	**0.97**
Traffic Accidents/ DUI	**2.74**	**3.04**	**-0.30**	**-6.57**	**<0.01**	**(-0.39, -0.21)**	**1.02**
Injuries Due To Falls or Crowds	**2.87**	**3.04**	**-0.17**	**-3.41**	**<0.01**	**(-0.26, -0.07)**	**0.96**

Table 9*: T-Test Results for Problematic Drinking Elements*

Trash and littering was widely considered the most problematic drinking element for both campus and community. As with the drinking locations, the rankings remain fairly consistent across groups. One noticeable result is that of all the significantly different elements, sexual assault is the only one in which the campus views it as more problematic. Figure 4 displays these results visually.

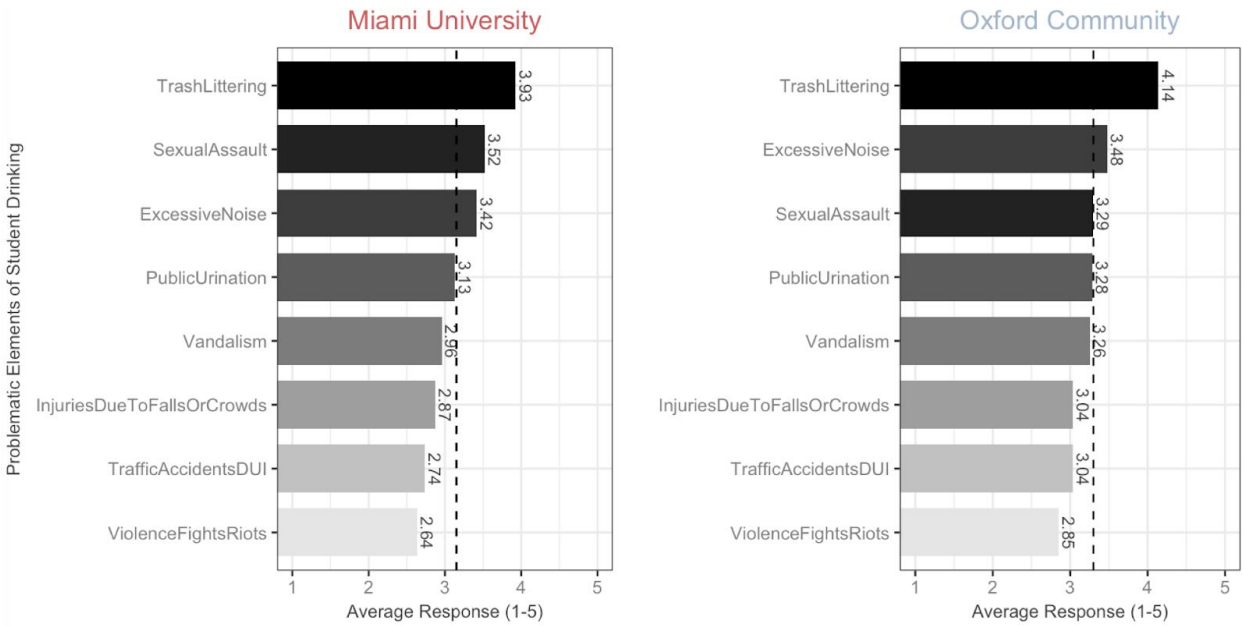

Figure 4: *Miami University and Oxford Community Mean Responses for Problematic Drinking Elements*

Overall, the objective one results suggest that both campus and community tend to agree on which nights, locations, and elements related to student drinking are problematic. There are certainly some differences (some significant and some not) in their ratings. Most of the time the significant results occur when the community rates the specific factor higher than the campus does. These two ideas combined suggest that the campus recognizes what causes the strain on the town-gown relationship, but they haven't necessarily put forth the effort to change these problems.

Objective 2

The only general concern question that had correlations with an absolute value of at least 0.300 with partying-related concerns dealt with student misbehavior (Table 10). In other words, community members who are concerned about partying-related misbehavior believe that student misbehavior in Oxford is a problem. The largest correlation observed, 0.649, was between responses to the question "To what extent has student partying put strain on campus-community ("town/gown") relationships?" and the statement "Student misbehavior in the community is a real problem" (Table 10).

Question	Correlation with Q12
To what extent has student partying put strain on campus-community ("town/gown") relationships?	0.649
Thinking about potential problems related to student partying, please rate how often these problems seem to occur in your community . . .	
Excessive noise	0.488
Trash/littering	0.453
Violence/fights/riots	0.456
Public urination	0.412
Vandalism	0.452
Traffic accidents/DUI	0.358
Injuries due to falls or crowds	0.389

Table 10. *Pearson's correlation coefficients for "Student misbehavior in the community is a real problem" (Q12).*

The results of the linear regressions confirm that affirmative responses to the statement "Student misbehavior in the community is a real problem" are related to the belief that student partying strains the relationship between the university and the Oxford community (Table 11, Table 12).

A small relationship between responses to some of the other general campus-community relationship concerns and the belief that student partying strains the relationship between the two groups is shown in two ways. First, the model that includes responses to multiple statements (Table 11) has a higher adjusted R-squared and a lower AIC than the model that only uses responses to "Student misbehavior in the community is a real problem" as a predictor (Table 12). Second, when the predictor for the student misbehavior question is removed from the model selection process, a model that explains a small amount of variation in the response and has two predictors with small p-values is produced (Table 13).

Initial Model **Adj R^2 = 0.4402 AIC = -183.5**				**Final Model** **Adj R^2 = 0.4441 AIC = -193.1**			
predictor	*estimate (SE)*	*t value*	*p value*	*predictor*	*estimate (SE)*	*t value*	*p value*
intercept	1.1589 (0.1879)	6.169	1.37×10^{-9}	*intercept*	1.1305 (0.1598)	7.075	4.7×10^{-12}
Q1	-0.0790 (0.0318)	-2.480	0.0134	*Q1*	-0.0862 (0.0303)	-2.851	0.00453
Q2	-0.0012 (0.0346)	-0.035	0.9721	*Q5*	0.0655 (0.0353)	1.857	0.06386
Q3	0.0132 (0.0280)	0.471	0.6381	*Q8*	0.0672 (0.0281)	2.390	0.01719
Q4	-0.0315 (0.0368)	-0.856	0.3922	*Q10*	0.0871 (0.0377)	2.311	0.02119
Q5	0.0755 (0.04257)	1.775	0.0765	*Q11*	-0.0753 (0.0417)	-1.806	0.07148
Q6	-0.0218 (0.0407)	-0.537	0.5917	*Q12*	0.5765 (0.0304)	18.944	$< 2\times10^{-16}$
Q7	-0.0089 (0.0354)	-0.252	0.8008				
Q8	0.0647 (0.0287)	2.256	0.0245				
Q9	0.0356 (0.0312)	1.143	0.2536				
Q10	0.0778 (0.0402)	1.933	0.0538				
Q11	-0.0740 (0.0423)	-1.749	0.0809				
Q12	0.5697 (0.0313)	18.185	$< 2\times10^{-16}$				

Table 11. *Multiple linear regression with answers to "To what extent has student partying put strain on campus-community ("town/gown") relationships?" as the response variable, using AIC for backward selection. Questions used as predictors (Q1-Q12) are listed in the methods.*

Model **Adj R^2 = 0.4232 AIC = -178.2**			
predictor	*estimate (SE)*	*t value*	*p value*
intercept	1.2227 (0.1222)	10.00	$< 2\times10^{-16}$
Q12	0.5943 (0.0299)	19.89	$< 2\times10^{-16}$

Table 12. *Linear regression with answers to "To what extent has student partying put strain on campus-community ("town/gown") relationships?" as the response variable and responses to "Student misbehavior in the community is a real problem" (Q12) as the predictor.*

Initial Model **Adj R^2 = 0.0900 AIC = 77.4**				**Final Model** **Adj R^2 = 0.0970 AIC = 65.4**			
predictor	*estimate (SE)*	*t value*	*p value*	*predictor*	*estimate (SE)*	*t value*	*p value*
intercept	2.6051 (0.2170)	12.005	$< 2\times10^{-16}$	*intercept*	2.7339 (0.1632)	16.748	$< 2\times10^{-16}$
Q1	-0.0646 (0.0406)	-1.593	0.111733	*Q1*	-0.05454 (0.0361)	-1.511	0.131
Q2	0.0324 (0.0441)	0.734	0.463546	*Q8*	0.1498 (0.0341)	4.395	1.34×10^{-5}
Q3	0.0354 (0.0357)	0.992	0.321465	*Q9*	0.1593 (0.0340)	4.688	3.51×10^{-6}
Q4	-0.0594 (0.0468)	-1.269	0.205000				
Q5	0.0099 (0.0541)	0.183	0.854852				
Q6	0.0073 (0.0518)	0.140	0.888704				
Q7	0.0200 (0.0451)	0.444	0.657316				
Q8	0.1440 (0.0361)	3.985	7.69×10^{-5}				
Q9	0.1400 (0.0391)	3.581	0.000374				
Q10	0.0468 (0.0513)	0.914	0.361218				
Q11	-0.0324 (0.0539)	-0.602	0.547636				

Table 13. *Multiple linear regression with answers to "To what extent has student partying put strain on campus-community ("town/gown") relationships?" as the response variable, using AIC for backward selection. Questions used as predictors (Q1-Q11) are listed in the methods.*

Discussion

Aside from responses to the statement “Student misbehavior in the community is a real problem,” responses to questions in the community survey that do not directly address student partying and do not show sizable correlation with responses to questions that ask about student partying. It may be reasonably assumed that many community members concerned about student misbehavior had misbehavior associated with partying and intoxication in mind when they responded to that statement, leading the responses to it to be related to responses to partying specific questions.

Overall, the analysis indicates that students, university staff, and community members believe that student partying has negative impacts on the community, although there is some discrepancy between how different groups think about those impacts. Also, community members appear to think about the negative effects of student partying and other aspects of university and community interactions as separate issues, which may be useful to know for people trying to improve general relations between the two groups.

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Appendix A: Code for Objective 1 (means and t-tests)

```
data=octa_data_dl_28Nov17_all
library(tidyverse)
testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Tuesday) %>%
  filter(is.na(Tuesday) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Tuesday~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Monday) %>%
  filter(is.na(Monday) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Monday~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Wednesday) %>%
  filter(is.na(Wednesday) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Wednesday~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Thursday) %>%
  filter(is.na(Thursday) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Thursday~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)
```

```
testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Friday) %>%
  filter(is.na(Friday) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Friday~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Saturday) %>%
  filter(is.na(Saturday) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Saturday~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Sunday) %>%
  filter(is.na(Sunday) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Sunday~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)


testdata <- data %>%
select(IAmCompletingThisSurveyAsA, ExcessiveNoise) %>%
filter(is.na(ExcessiveNoise)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$ExcessiveNoise~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA,TrashLittering) %>%
```

```
  filter(is.na(TrashLittering)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$TrashLittering~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, ViolenceFightsRiots) %>%
  filter(is.na(ViolenceFightsRiots)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$ViolenceFightsRiots~testdata$IAmCompletingThisSurveyA
sA, alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, PublicUrination) %>%
  filter(is.na(PublicUrination)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$PublicUrination~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, SexualAssault) %>%
  filter(is.na(SexualAssault)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$SexualAssault~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA,Vandalism) %>%
  filter(is.na(Vandalism)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
```

```
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$Vandalism~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, TrafficAccidentsDUI) %>%
  filter(is.na(TrafficAccidentsDUI)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$TrafficAccidentsDUI~testdata$IAmCompletingThisSurveyA
sA, alternative=c("two.sided"), var.equal=T)


testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, InjuriesDueToFallsOrCrowds) %>%
  filter(is.na(InjuriesDueToFallsOrCrowds)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$InjuriesDueToFallsOrCrowds~testdata$IAmCompletingThis
SurveyAsA, alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
                                    select(IAmCompletingThisSurveyAsA,
PrivateResidencesIncludingHousesApartmentsAndMiniDorms) %>%

 filter(is.na(PrivateResidencesIncludingHousesApartmentsAndMiniDorms)
== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$PrivateResidencesIncludingHousesApartmentsAndMiniDorm
s~testdata$IAmCompletingThisSurveyAsA,alternative=c("two.sided"),
var.equal=T)



testdata <- data %>%
```

```
  select(IAmCompletingThisSurveyAsA, FraternityHouses) %>%
  filter(is.na(FraternityHouses)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$FraternityHouses~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)

testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, BarsTavernsAndNightclubs) %>%
  filter(is.na(BarsTavernsAndNightclubs)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$
BarsTavernsAndNightclubs~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)


testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, Restaurants) %>%
  filter(is.na(Restaurants)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$     Restaurants~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)




testdata <- data %>%
  select(IAmCompletingThisSurveyAsA, OnCampusResidenceHalls) %>%
  filter(is.na(OnCampusResidenceHalls)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$
OnCampusResidenceHalls~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)
```

```
testdata <- data %>%
   select(IAmCompletingThisSurveyAsA,  StadiumArenaOrTailgateParties)
%>%
  filter(is.na(StadiumArenaOrTailgateParties)== F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$
StadiumArenaOrTailgateParties~testdata$IAmCompletingThisSurveyAsA,alt
ernative=c("two.sided"), var.equal=T)
```

```
setwd("~/Desktop/STA 475")
library(readxl)
survey <- read_excel("octa_data_dl_28Nov17_all.xlsx")

## Do different groups have a different perception or ranking ##
## of the most problematic elements of student drinking?      ##
## constructing tables
library(tidyverse)
valid_column_names  <-  make.names(names=names(survey),  unique=TRUE,
allow_ = TRUE)
names(survey) <- valid_column_names
elements <- survey %>%
   #filter(IAmCompletingThisSurveyAsA  ==  "member  of  the  community")
%>%
  group_by(PleaseSelectTheBESTDescriptionOfYourRole) %>%
  #group_by(IAmCompletingThisSurveyAsA) %>%
  summarise(#count = n(),
            en = sd(ExcessiveNoise, na.rm = T),
            tl = sd(TrashLittering, na.rm = T),
            vfr = sd(ViolenceFightsRiots, na.rm = T),
            pu = sd(PublicUrination, na.rm = T),
            sa = sd(SexualAssault, na.rm = T),
            v = sd(Vandalism, na.rm = T),
            tad = sd(TrafficAccidentsDUI, na.rm = T),
            idtfoc = sd(InjuriesDueToFallsOrCrowds, na.rm = T)
            )

survey$element  <-  (survey$ExcessiveNoise  +  survey$TrashLittering  +
survey$ViolenceFightsRiots + survey$PublicUrination +
```

```
        survey$SexualAssault       +       survey$Vandalism       +
survey$TrafficAccidentsDUI + survey$InjuriesDueToFallsOrCrowds)/8
survey$day <- (survey$Monday + survey$Tuesday + survey$Wednesday +
survey$Thursday + survey$Friday + survey$Saturday +
                 survey$Sunday)/7
survey$place                                                    <-
(survey$PrivateResidencesIncludingHousesApartmentsAndMiniDorms      +
survey$FraternityHouses +
                            survey$BarsTavernsAndNightclubs         +
survey$Restaurants + survey$OnCampusResidenceHalls +
                  survey$StadiumArenaOrTailgateParties)/6
overall <- survey %>%
  #group_by(PleaseSelectTheBESTDescriptionOfYourRole) %>%
  #group_by(IAmCompletingThisSurveyAsA) %>%
  summarise(count = n(),
            em = mean(element, na.rm = T),
            esd = sd(element, na.rm = T),
            dm = mean(day, na.rm = T),
            dsd = sd(day,na.rm = T),
            pm = mean(place, na.rm = T),
            psd = sd(place, na.rm = T))

## possible mean comparisons # t test
#test difference between campus and community
#test difference between subgroups and overall
#sub groups and campus/community averages

# t test assumptions
# 1. normality (CLT - large enough sample size)
#  2.  equal  variance  (test  this)  (t-test  for  unequal  variance
otherwise)
#  3.  independent  obs  (did  someone  submit  the  survey  twice  on
different computers)

# example
testdata <- survey %>%
  select(IAmCompletingThisSurveyAsA, ExcessiveNoise) %>%
  filter(is.na(ExcessiveNoise) == F)
campus  <-  testdata[testdata$IAmCompletingThisSurveyAsA!="member  of
the community", 2]
community <- testdata[testdata$IAmCompletingThisSurveyAsA=="member of
the community", 2]
var(campus)/var(community) # <1 population variance are equal
t.test(testdata$ExcessiveNoise~testdata$IAmCompletingThisSurveyAsA,
alternative=c("two.sided"), var.equal=T)


##############################################
```

```
### drinking element visualization
element_campus <- survey %>%
  filter(IAmCompletingThisSurveyAsA != "member of the community") %>%
     select(ExcessiveNoise,    TrashLittering,    ViolenceFightsRiots,
PublicUrination,
              SexualAssault,      Vandalism,      TrafficAccidentsDUI,
InjuriesDueToFallsOrCrowds)
element_campus    <-    gather(element_campus,    element,    value,
ExcessiveNoise:InjuriesDueToFallsOrCrowds, factor_key = TRUE)
element_campus <- element_campus %>%
  group_by(element) %>%
  summarise(mean = mean(value, na.rm = T))

barcolor <- c("1", "2", "3", "4", "5", "6", "7", "8")
e1 <- ggplot(data = element_campus) +
    geom_bar(aes(x=reorder(element,   mean),   y   =   mean,   fill   =
barcolor),width = .75, stat = "identity") +
                                      geom_text(aes(x=reorder(element,
mean),y=mean,label=round(mean,2)),vjust=-.3,
            size = 3, angle = 270, color = "grey25") +
    coord_flip()   +   theme_bw()   +   scale_fill_manual(values   =
c("lightgrey", "lightskyblue",

                                                              "lightsteel
blue","aliceblue", "indianred", "skyblue",  "steelblue","blue")) +
  theme(legend.position = "none",
        axis.title.x=element_text(size = 9, colour = "grey25"),
        axis.text.x=element_text(size = 9, colour = "grey50"),
        axis.title.y=element_text(size = 9, colour = "grey25"),
        axis.text.y=element_text(size = 9, colour = "grey50"),
        plot.title = element_text(color = "indianred", hjust = 0.5)
        ) +
   labs(y = "Average Response (1-5)", x = "Problematic Elements of
Student Drinking",
       title = "Miami University") +
  geom_hline(yintercept = 3.15, linetype = "dashed")

element_com <- survey %>%
  filter(IAmCompletingThisSurveyAsA == "member of the community") %>%
     select(ExcessiveNoise,    TrashLittering,    ViolenceFightsRiots,
PublicUrination,
              SexualAssault,      Vandalism,      TrafficAccidentsDUI,
InjuriesDueToFallsOrCrowds)
element_com      <-      gather(element_com,      element,      value,
ExcessiveNoise:InjuriesDueToFallsOrCrowds, factor_key = TRUE)
element_com <- element_com %>%
  group_by(element) %>%
  summarise(mean = mean(value, na.rm = T))
```

```
barcolor <- c("1", "2", "3", "4", "5", "6", "7", "8")
e2 <- ggplot(data = element_com) +
    geom_bar(aes(x=reorder(element,   mean),   y   =   mean,   fill   =
barcolor),width = .75, stat = "identity") +
                                        geom_text(aes(x=reorder(element,
mean),y=mean,label=round(mean,2)),vjust=-.3,
            size = 3, angle = 270,color = "grey25") +
    coord_flip()   +   theme_bw()   +   scale_fill_manual(values   =
c("lightgrey", "lightskyblue",

                                                              "lightsteel
blue", "aliceblue", "indianred","skyblue","blue", "steelblue")) +
  theme(legend.position = "none",
        axis.title.x=element_text(size = 9, colour = "grey25"),
        axis.text.x=element_text(size = 9, colour = "grey50"),
        axis.title.y=element_text(size = 9, colour = "grey25"),
        axis.text.y=element_text(size = 9, colour = "grey50"),
        plot.title = element_text(color = "lightsteelblue3", hjust =
0.5)
  ) +
  labs(y = "Average Response (1-5)", x = "",
       title = "Oxford Community") +
  geom_hline(yintercept = 3.30, linetype = "dashed")

library(gridExtra)
grid.arrange(e1, e2, ncol = 2)

############################
### night of week visualization

day_campus <- survey %>%
  filter(IAmCompletingThisSurveyAsA != "member of the community") %>%
   select(Monday,  Tuesday,  Wednesday,  Thursday,  Friday,  Saturday,
Sunday)
day_campus   <-   gather(day_campus,   day,   value,   Monday:Sunday,
factor_key = TRUE)
day_campus <- day_campus %>%
  group_by(day) %>%
  summarise(mean = mean(value, na.rm = T))

barcolor <- c("n", "y", rep("n", 4), "y1")
d1 <- ggplot(data = day_campus) +
  geom_bar(aes(x=reorder(day, mean), y = mean, fill = barcolor),width
= .75, stat = "identity") +
                                          geom_text(aes(x=reorder(day,
mean),y=mean,label=round(mean,2)),vjust=-.3,
            size = 3, angle = 270, color = "grey25") +
```

```
    coord_flip()   +   theme_bw()   +   scale_fill_manual(values   =
c("lightgrey", "indianred", "lightsteelblue3")) +
  theme(legend.position = "none",
        axis.title.x=element_text(size = 9, colour = "grey25"),
        axis.text.x=element_text(size = 9, colour = "grey50"),
        axis.title.y=element_text(size = 9, colour = "grey25"),
        axis.text.y=element_text(size = 9, colour = "grey50"),
        plot.title = element_text(color = "indianred", hjust = 0.5)
  ) +
   labs(y  =  "Average  Response  (1-5)",  x  =  "Problematic  Drinking
Nights",
       title = "Miami University") +
  geom_hline(yintercept = 3.01, linetype = "dashed")

day_com <- survey %>%
  filter(IAmCompletingThisSurveyAsA == "member of the community") %>%
   select(Monday,  Tuesday,  Wednesday,  Thursday,  Friday,  Saturday,
Sunday)
day_com  <-  gather(day_com,  day,  value,  Monday:Sunday,  factor_key  =
TRUE)
day_com <- day_com %>%
  group_by(day) %>%
  summarise(mean = mean(value, na.rm = T))

barcolor <- c("n", "y", rep("n", 4), "y1")
d2 <- ggplot(data = day_com) +
  geom_bar(aes(x=reorder(day, mean), y = mean, fill = barcolor),width
= .75, stat = "identity") +
                                        geom_text(aes(x=reorder(day,
mean),y=mean,label=round(mean,2)),vjust=-.3,
            size = 3, angle = 270,color = "grey25") +
    coord_flip()   +   theme_bw()   +   scale_fill_manual(values   =
c("lightgrey", "indianred", "lightsteelblue3")) +
  theme(legend.position = "none",
        axis.title.x=element_text(size = 9, colour = "grey25"),
        axis.text.x=element_text(size = 9, colour = "grey50"),
        axis.title.y=element_text(size = 9, colour = "grey25"),
        axis.text.y=element_text(size = 9, colour = "grey50"),
        plot.title = element_text(color = "lightsteelblue3", hjust =
0.5)
  ) +
  labs(y = "Average Response (1-5)", x = "",
       title = "Oxford Community") +
  geom_hline(yintercept = 2.97, linetype = "dashed")

library(gridExtra)
grid.arrange(d1, d2, ncol = 2)
```

```
#######################
## drinking location visualization
place_campus <- survey %>%
  filter(IAmCompletingThisSurveyAsA != "member of the community") %>%
       select(PrivateResidencesIncludingHousesApartmentsAndMiniDorms,
FraternityHouses,
                     BarsTavernsAndNightclubs,            Restaurants,
OnCampusResidenceHalls,
         StadiumArenaOrTailgateParties)
place_campus      <-      gather(place_campus,      place,      value,
PrivateResidencesIncludingHousesApartmentsAndMiniDorms:StadiumArenaOr
TailgateParties, factor_key = TRUE)
levels(place_campus$place)[levels(place_campus$place)=="PrivateReside
ncesIncludingHousesApartmentsAndMiniDorms"] <- "PrivateResidences"
place_campus <- place_campus %>%
  group_by(place) %>%
  summarise(mean = mean(value, na.rm = T))

barcolor <- c("y", "n", "y2" ,"y3", "y1", "n")
p1 <- ggplot(data = place_campus) +
    geom_bar(aes(x=reorder(place,   mean),   y   =   mean,   fill   =
barcolor),width = .75, stat = "identity") +
                                        geom_text(aes(x=reorder(place,
mean),y=mean,label=round(mean,2)),vjust=-.3,
            size = 3, angle = 270, color = "grey25") +
  scale_x_discrete(labels = c('Stadium Arena\n Or Tailgate Parties',
                              'Restaurants',
                              'On Campus\n Residence Halls',
                              'Private\n Residences',
                              'Bars, Taverns,\n and Nightclubs',
                              'Fraternity\n Houses')) +
    coord_flip()   +   theme_bw()   +   scale_fill_manual(values   =
c("lightgrey","steelblue4","indianred",                    "skyblue1",
"lightsteelblue3")) +
  theme(legend.position = "none",
        axis.title.x=element_text(size = 9, colour = "grey25"),
        axis.text.x=element_text(size = 9, colour = "grey50"),
        axis.title.y=element_text(size = 9, colour = "grey25"),
        axis.text.y=element_text(size = 9, colour = "grey50"),
        plot.title = element_text(color = "indianred", hjust = 0.5)
  ) +
   labs(y = "Average Response (1-5)", x = "Problematic Locations of
Drinking",
       title = "Miami University") +
  geom_hline(yintercept = 2.84, linetype = "dashed")

place_com <- survey %>%
  filter(IAmCompletingThisSurveyAsA == "member of the community") %>%
```

```
       select(PrivateResidencesIncludingHousesApartmentsAndMiniDorms,
FraternityHouses,
                     BarsTavernsAndNightclubs,            Restaurants,
OnCampusResidenceHalls,
         StadiumArenaOrTailgateParties)
place_com       <-       gather(place_com,       place,       value,
PrivateResidencesIncludingHousesApartmentsAndMiniDorms:StadiumArenaOr
TailgateParties, factor_key = TRUE)
levels(place_com$place)[levels(place_com$place)=="PrivateResidencesIn
cludingHousesApartmentsAndMiniDorms"] <- "PrivateResidences"
place_com <- place_com %>%
  group_by(place) %>%
  summarise(mean = mean(value, na.rm = T))

barcolor <- c("y", "n", "y2" ,"y3", "y1", "n")
p2 <- ggplot(data = place_com) +
    geom_bar(aes(x=reorder(place,   mean),   y   =   mean,   fill   =
barcolor),width = .75, stat = "identity") +
                                        geom_text(aes(x=reorder(place,
mean),y=mean,label=round(mean,2)),vjust=-.3,
            size = 3, angle = 270,color = "grey25") +
  scale_x_discrete(labels = c('Stadium Arena\n Or Tailgate Parties',
                              'On Campus\n Residence Halls',
                              'Restaurants',
                              'Private\n Residences',
                              'Fraternity\n Houses',
                              'Bars, Taverns,\n and Nightclubs' )) +
    coord_flip()   +   theme_bw()   +   scale_fill_manual(values   =
c("lightgrey","steelblue4","indianred",                    "skyblue1",
"lightsteelblue3")) +
  theme(legend.position = "none",
        axis.title.x=element_text(size = 9, colour = "grey25"),
        axis.text.x=element_text(size = 9, colour = "grey50"),
        axis.title.y=element_text(size = 9, colour = "grey25"),
        axis.text.y=element_text(size = 9, colour = "grey50"),
        plot.title = element_text(color = "lightsteelblue3", hjust =
0.5)
  ) +
  labs(y = "Average Response (1-5)", x = "",
       title = "Oxford Community") +
  geom_hline(yintercept = 2.88, linetype = "dashed")

library(gridExtra)
grid.arrange(p1, p2, ncol = 2)
```

Appendix B: Code for objective 2 (correlations and regression)

```
# Read in data file with all community responses

community <- read.csv("Community Full.csv", header = TRUE)


# Remove "Don't know" responses from questions of interest

community$ThereAreNotEnoughEventsOnCampusThatInterestMe[community$There
reAreNotEnoughEventsOnCampusThatInterestMe == 6] <- NA

community$CourseworkOfferedOnCampusIsTooExpensive[community$Coursewor
kOfferedOnCampusIsTooExpensive == 6] <- NA

community$TheCampusSeemsDifficultToGetTo[community$TheCampusSeemsDiff
icultToGetTo == 6] <- NA

community$NotEnoughClassesAndDegreesAreOfferedOnTheCampus[community$N
otEnoughClassesAndDegreesAreOfferedOnTheCampus == 6] <- NA

community$CampusRepresentativesDoNotReadilyShareTheirExpertiseWithThe
Community[community$CampusRepresentativesDoNotReadilyShareTheirExpert
iseWithTheCommunity == 6] <- NA

community$CampusRepresentativesAreNotWellConnectedToTheLocalSchoolDis
tricts[community$CampusRepresentativesAreNotWellConnectedToTheLocalSc
hoolDistricts == 6] <- NA

community$ItSHardToKnowWhatSHappeningOnCampus[community$ItSHardToKnow
WhatSHappeningOnCampus == 6] <- NA

community$PeopleFromTheCampusDonTLiveInOurCommunity[community$PeopleF
romTheCampusDonTLiveInOurCommunity == 6] <- NA

community$TheCampusDoesNotContributeAsMuchAsItCouldToTheLocalEconomy[
community$TheCampusDoesNotContributeAsMuchAsItCouldToTheLocalEconomy
== 6] <- NA

community$PeopleFromTheCampusDoNotGetInvolvedInVolunteerEffortsInTheC
ommunity[community$PeopleFromTheCampusDoNotGetInvolvedInVolunteerEffo
rtsInTheCommunity == 6] <- NA

community$CampusRepresentativesAreNotVeryVisibleAtCommunityEvents[com
munity$CampusRepresentativesAreNotVeryVisibleAtCommunityEvents == 6]
<- NA

community$StudentMisbehaviorInTheCommunityIsARealProblem[community$St
udentMisbehaviorInTheCommunityIsARealProblem == 6] <- NA
```

```
# Example correlation calculation
cor(community$ThereAreNotEnoughEventsOnCampusThatInterestMe,

community$ToWhatExtentHasStudentPartyingPutStrainOnCampusCommunityTownGownRelationships,
     use = "pairwise.complete.obs")


# Remove rows with missing values
community <- community[!is.na(community$ToWhatExtentHasStudentPartyingPutStrainOnCampusCommunityTownGownRelationships),]
community <- community[!is.na(community$ThereAreNotEnoughEventsOnCampusThatInterestMe),]
community <- community[!is.na(community$CourseworkOfferedOnCampusIsTooExpensive),]
community <- community[!is.na(community$TheCampusSeemsDifficultToGetTo),]
community <- community[!is.na(community$NotEnoughClassesAndDegreesAreOfferedOnTheCampus),]
community <- community[!is.na(community$CampusRepresentativesDoNotReadilyShareTheirExpertiseWithTheCommunity),]
community <- community[!is.na(community$CampusRepresentativesAreNotWellConnectedToTheLocalSchoolDistricts),]
community <- community[!is.na(community$ItSHardToKnowWhatSHappeningOnCampus),]
community <- community[!is.na(community$PeopleFromTheCampusDonTLiveInOurCommunity),]
community <- community[!is.na(community$TheCampusDoesNotContributeAsMuchAsItCouldToTheLocalEconomy),]
```

```
community <-
community[!is.na(community$PeopleFromTheCampusDoNotGetInvolvedInVolun
teerEffortsInTheCommunity),]

community <-
community[!is.na(community$CampusRepresentativesAreNotVeryVisibleAtCo
mmunityEvents),]

community <-
community[!is.na(community$StudentMisbehaviorInTheCommunityIsARealPro
blem),]


# Linear regression

strain_fit <-
lm(ToWhatExtentHasStudentPartyingPutStrainOnCampusCommunityTownGownRe
lationships ~

                ThereAreNotEnoughEventsOnCampusThatInterestMe +

                CourseworkOfferedOnCampusIsTooExpensive +

                TheCampusSeemsDifficultToGetTo +

                NotEnoughClassesAndDegreesAreOfferedOnTheCampus +


CampusRepresentativesDoNotReadilyShareTheirExpertiseWithTheCommunity
+


CampusRepresentativesAreNotWellConnectedToTheLocalSchoolDistricts +

                ItSHardToKnowWhatSHappeningOnCampus +

                PeopleFromTheCampusDonTLiveInOurCommunity +


TheCampusDoesNotContributeAsMuchAsItCouldToTheLocalEconomy +


PeopleFromTheCampusDoNotGetInvolvedInVolunteerEffortsInTheCommunity +


CampusRepresentativesAreNotVeryVisibleAtCommunityEvents +

                StudentMisbehaviorInTheCommunityIsARealProblem,
data=community )

summary(strain_fit)

extractAIC(strain_fit)

library(car)
```

```
vif(strain_fit)

library(MASS)

strain_step <- stepAIC(strain_fit, direction="backward")

summary(strain_step)

extractAIC(strain_step)

vif(strain_step)


strain_mis                                                              <-
lm(ToWhatExtentHasStudentPartyingPutStrainOnCampusCommunityTownGownRe
lationships ~

                StudentMisbehaviorInTheCommunityIsARealProblem,
data=community )

summary(strain_mis)

extractAIC(strain_mis)


strain_fit2                                                             <-
lm(ToWhatExtentHasStudentPartyingPutStrainOnCampusCommunityTownGownRe
lationships ~

                    ThereAreNotEnoughEventsOnCampusThatInterestMe +

                    CourseworkOfferedOnCampusIsTooExpensive +

                    TheCampusSeemsDifficultToGetTo +

                    NotEnoughClassesAndDegreesAreOfferedOnTheCampus
+


CampusRepresentativesDoNotReadilyShareTheirExpertiseWithTheCommunity
+


CampusRepresentativesAreNotWellConnectedToTheLocalSchoolDistricts +

                    ItSHardToKnowWhatSHappeningOnCampus +

                    PeopleFromTheCampusDonTLiveInOurCommunity +


TheCampusDoesNotContributeAsMuchAsItCouldToTheLocalEconomy +


PeopleFromTheCampusDoNotGetInvolvedInVolunteerEffortsInTheCommunity +
```

```
CampusRepresentativesAreNotVeryVisibleAtCommunityEvents                ,
data=community )

summary(strain_fit2)

extractAIC(strain_fit2)

vif(strain_fit2)

strain_step2 <- stepAIC(strain_fit2, direction="backward")

summary(strain_step2)

vif(strain_step2)

extractAIC(strain_step2)
```