An Examination Regarding Satisfaction with UMass Amherst Among Undergraduate Students

University of Massachusetts Amherst
Statistics 240 Honors: Introduction to Statistics
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Introduction

The college or university someone attends helps to shape their future. There are a wide variety of factors that can influence someone's college experience. These can include, but are not limited to, the people someone meets and what they do in their free time. Although many students attend a college or university, they may have varying levels of satisfaction with it.

Perhaps, an analysis of how satisfied students are with a college or university can be used to improve the experience of students while balancing out another important factor such as faculty happiness. It is especially helpful to gauge the perceptions that current students have of their college or university. This is important because both the desires of students and what is available will change over time with innovations in areas such as technology. Our overall objective was to determine factors that contributed to undergraduate happiness with UMass Amherst.

Methods

We formulated an 18 question survey using google forms to determine the extent to which certain factors contribute to undergraduate happiness with UMass Amherst. Our survey was distributed via word of mouth, class pages on facebook, and school email addresses. The survey was made available to undergraduate students at UMass Amherst starting on March 24th. The data collection period ended a few weeks later on April 9th, and in the end there were 259 total respondents to our survey. Before the data was transferred to Microsoft Excel or Minitab Express, certain data was omitted. This data included those who answered "other" for gender and those who considered themselves neither an introvert or extrovert for example. When there is a very small percentage of answers for a certain question, the responses can be considered outliers that cannot help to make conclusions about the entire population.

Additionally, the sample was not random based on how it was distributed, but the large sample size means that the data should be sufficient enough to draw conclusions about the population of undergraduate students at UMass Amherst. Based on the questions we posed, we had around an equal amount of qualitative and quantitative responses to work with. In the end, we decided to introduce each piece of data and then focus on meaningful tests that could tell us more about the data we had. We analyzed categorical data with the chi-squared test. On the other hand, we used the t-distribution and 1- sample proportion confidence intervals using most popular responses for numerical data and descriptive statistics. To combine both qualitative and quantitative data, we used one way analysis of variance (ANOVA) tests.

Data, Analysis, and Results

Data introduction:

The first questions we posed only had two major responses. The other answers were disregarded due to their minute frequency compared to the other options.

For the first question, approximately two out of three people considered themselves an introvert while only one out of three people considered themselves an extrovert.

Next, around seventy five percent of the respondents for our survey were female. This is one example of how our survey did not capture a random sample of the UMass Amherst undergraduate population, which in reality is much closer to a fifty fifty split between males and females.

As for schools within UMass Amherst, the majority of the participants were from the College of Natural science with a percentage of 45.9. The least was the College of Nursing coming in with 2.7%. This shows that for this question, our sample population was not at all random.

For the majority of our participants, most said UMass was not their first choice accounting for 66.8%. Only 33.2% of our participants said answered UMass to be their top choice.

Participants were asked whether or not they would recommend UMass to people over other universities or colleges. Most undergraduate students, 87.6%, said that they would recommend UMass, and 12.4% said they would not.

Participants were asked whether or not they were satisfied with the WiFi at UMass. The responses for this question were more evenly split. 54.1% of the participants said they were and 45.9% responded that they were not.

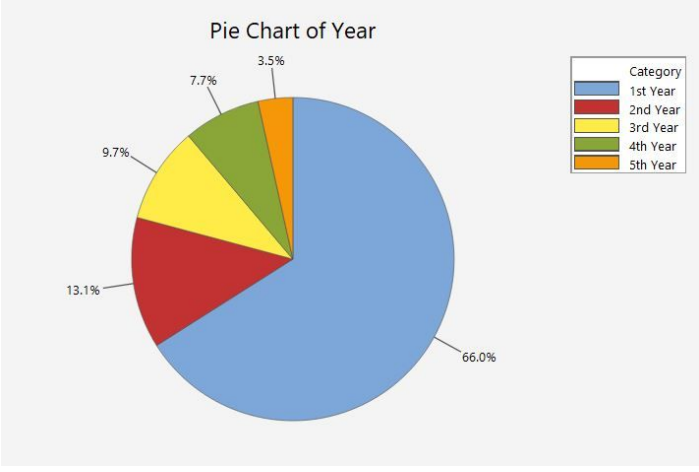
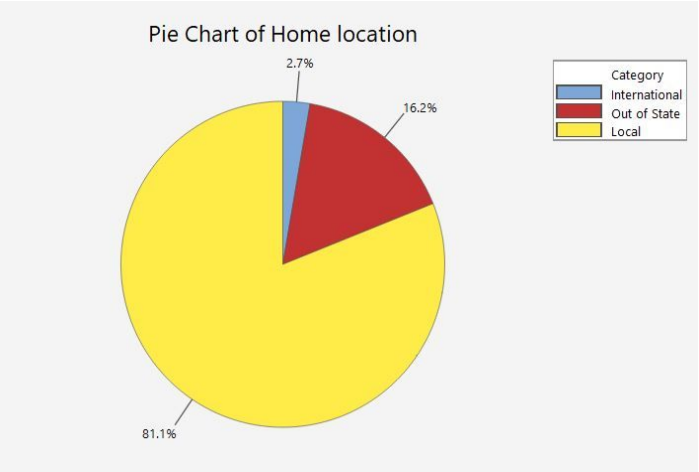


Figure 1: Pie Chart of Year of Participants

Our data was mainly from newer UMass Amherst undergraduate students. The vast majority of the respondents, being 66%, are in their first year at UMass Amherst and the number of people who responded to this survey decreases as the years they have spent at UMass Amherst increases. 3.5% of the participants were 5th year students.

Figure 2: Pie Chart Year of Home Location

Most people in our sample were local meaning that they lived in Massachusetts. Among those who were out of state and international, out of state was much more common. 81.1% were local, 16.2% were out of state, and 2.7% were international.



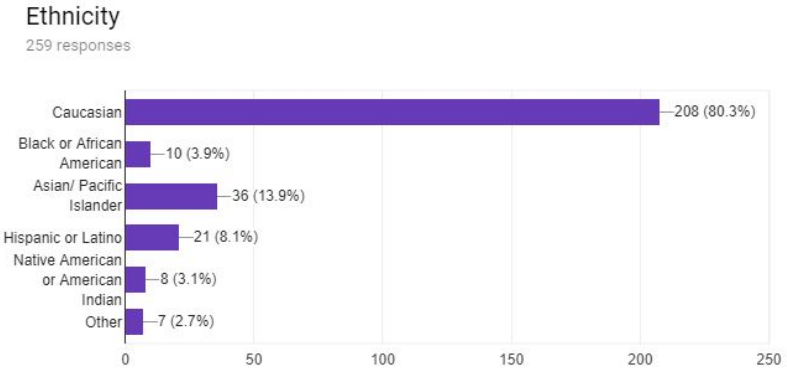
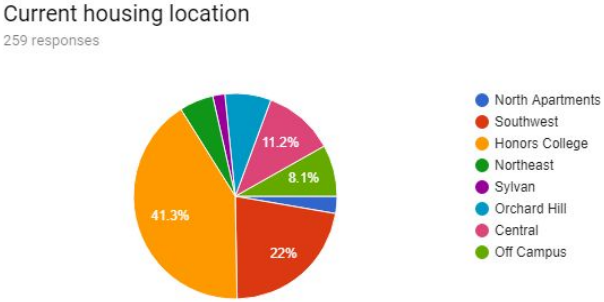


Figure 3: Horizontal Bar Chart of Ethnicity

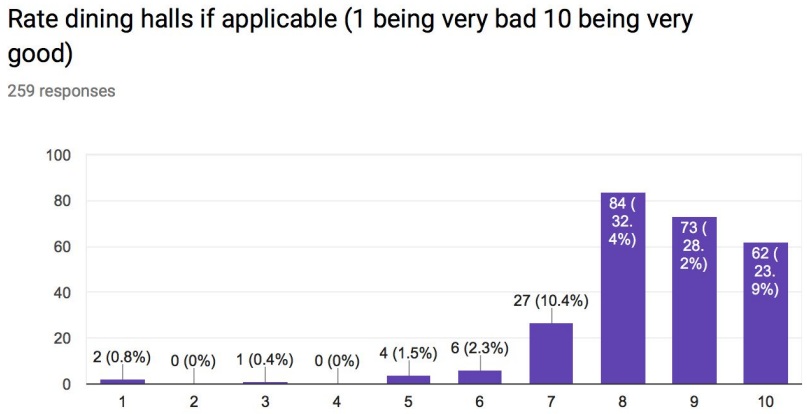
A majority of our participants were caucasian, with percentage of 80.3. Asian/ Pacific Islander came in second with 13.9%. The least was in the others category with 2.7%. This shows that our sample for this question in particular was not random.

Figure 4: Pie Chart of Location on Campus



The majority of the housing choice from all of our participant is living in the Honors College, coming in at 41.3%. The least being Sylvan, coming in at 1.9%.

Figure 5: Vertical Bar Chart of Dining Halls



A majority if the participants, being 32.4%, reported on a scale of 1-10, with 10 being the best, the dining halls were an 8. 5% of the participants rated the dining halls to be anywhere from a 1 to 6 on the same scale.

Figure 6: Vertical bar Chart of Ratings of Professors

Most participants (36.7%) rated professors to be an 8, on a scale of 1 to 10, with 10 being the best. 8.5% of participants reported that professors ranged from a 1-5 on the same scale.

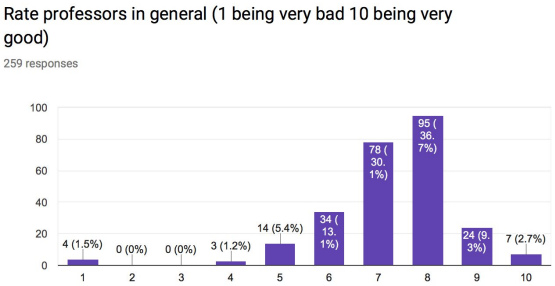


Figure 7: Vertical Bar Chart of How often student attend campus Events

Participants were asked to report how often they attend campus events on a scale of 1 to 10. A majority of the participants reported a rating of 2 to 5, which consists of 68.5% of the participants. 2.8% of the participants reported a 9 or 10.

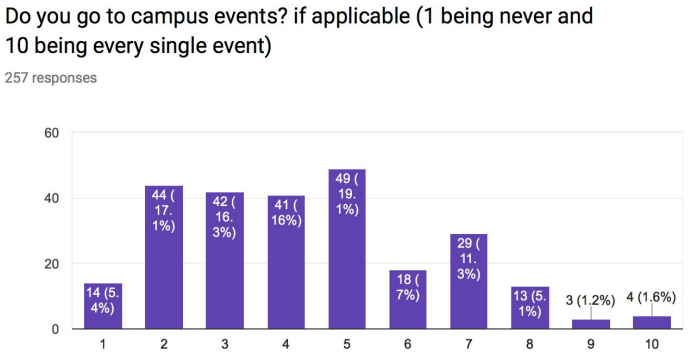
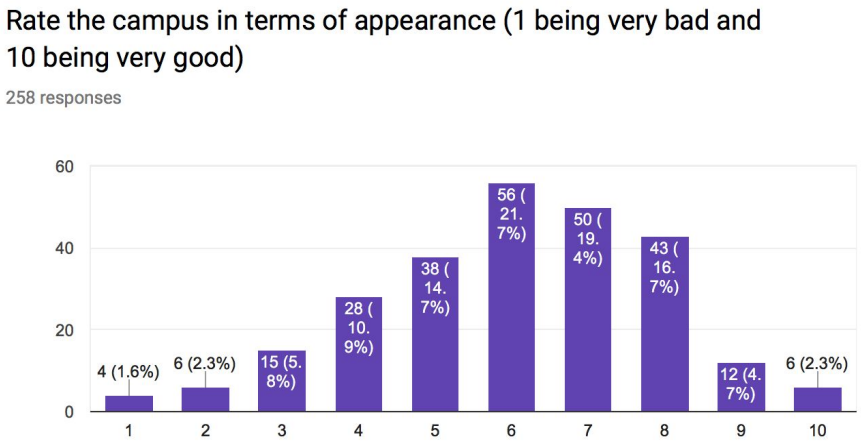


Figure 8: Vertical Bar Chart of Ratings of Campus Appearance



Most participants, being 21.7%, rated the appearance of the campus to be a six on a scale of 1 to 10, with 10 being the best. 1.6% of the participants rated the appearance to be a 1, while 2.3% of the participants rated it to be a 10.

Figure 9: Pie Chart of Current Participation in Extracurricular Activities

The participants were also asked to report the number of extracurricular activities they are involved in. 31.3% of the participants reported that they were involved in 2 extracurricular activities whereas 5.4% were involved in 5 or more.

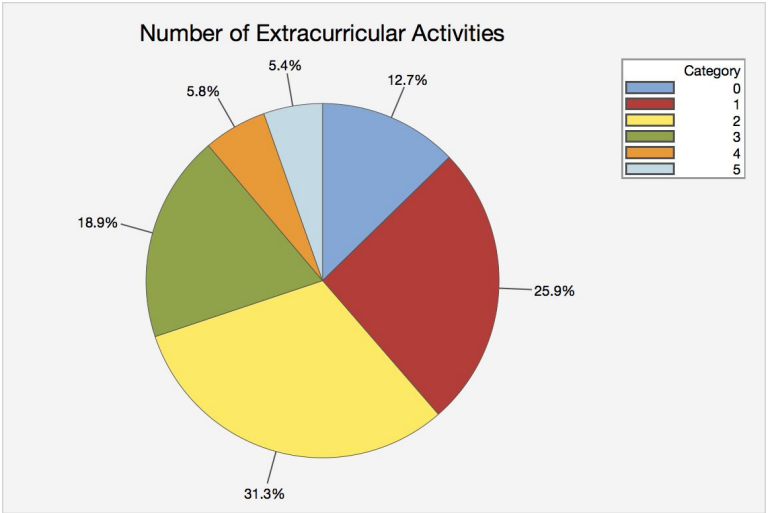
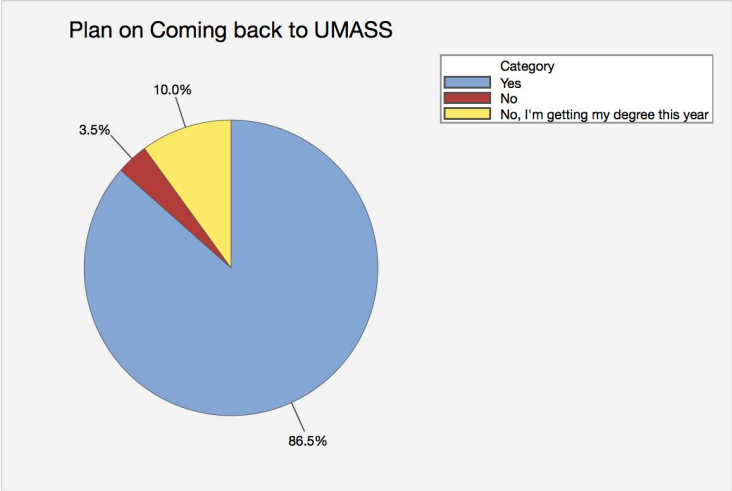


Figure 10: Pie Chart of Future Plans to Attend UMass



Participants were asked whether they were planning on attending UMass the upcoming semester. A majority of participants, being 86.5% said that they are planning to come back, 3.5% said they were not planning to come back, and 10.0% are graduating.

Figure 11: Pie Chart of what students are most satisfied with at UMass

When asked what they are most satisfied with at UMass, most participants, being 33.9% said that they were most satisfied with the education the university has to offer. 1.6% of the participants said they were most satisfied with the landscape.

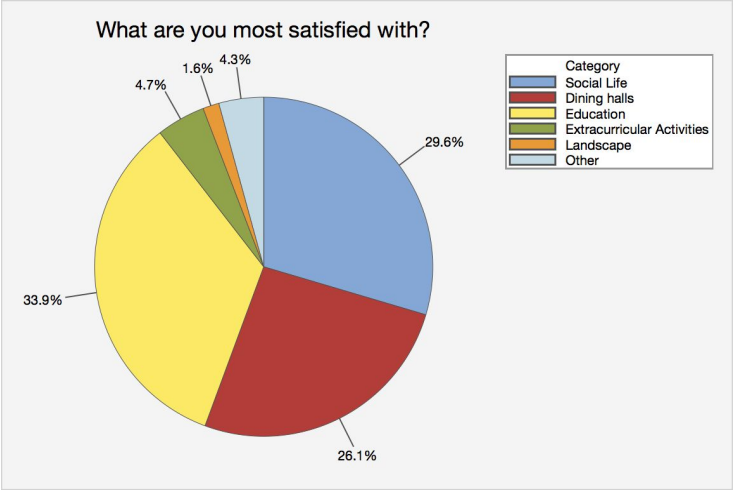
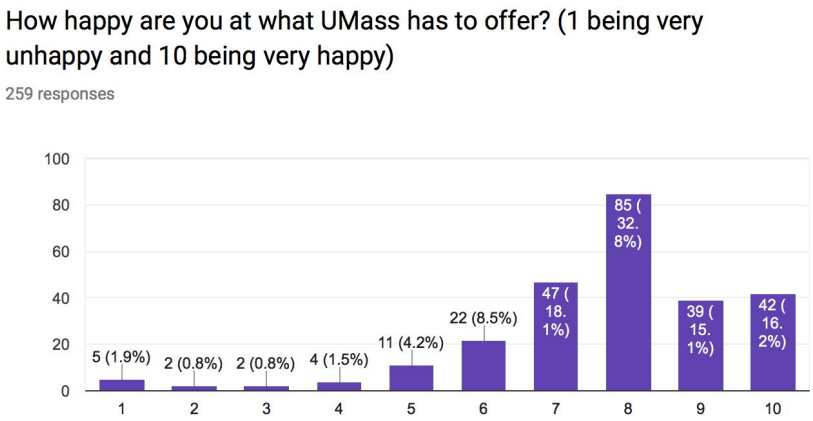


Figure 12: Vertical Bar Chart of how happy students are with what UMass has to offer



When asked to rate their happiness with what UMass has to offer, a majority of participant, being 32.8% rated an 8 out of 10. 9.2% of participants rated their happiness between 1 and 5.

Beginning of analysis and results:

Rows: Would you recommend UMass? Columns: Are you satisfied with the wifi

	No	Yes	All
No	19	13	32
	14.70	17.30	
Yes	100	127	227
	104.30	122.70	
All	119	140	259

Cell Contents: Count
Expected count

Chi-Square Test

	Chi-Square	DF	P-Value
Pearson	2.65	1	0.1035
Likelihood Ratio	2.65	1	0.1038

Chi-squared test

A chi squared test for relationship between personality type and gender was conducted along with other categorical variables that we asked questions about. However, the chi squared test shown below is for the questions would you recommend UMass and are you satisfied with the wifi at UMass? Our hypothesis was that no relationship exists between these two variables, and the tests we ran all yielded p-values much larger than 0.05. The claim should not be rejected, no relationship seems to exist between these two variables based partly due to our relatively small sample size. However, the analysis of the questions would you recommend UMass and are you satisfied with the wifi at UMass was the closest to having the hypothesis rejected based on the relatively low p-value.

Table 1: Chi-Squared Test for Would You Recommend UMass and Are You Satisfied with the WiFi at UMass?

Descriptive statistics for the mean using the t-distribution:

Descriptive Statistics

N	Mean	StDev	SE Mean	95% CI for μ
243	1.78189	1.09741	0.07040	(1.64322, 1.92057)

μ: mean of Number of current extracurricul

Table 2: Descriptive Statistics for the mean number of extracurriculars undergraduates are a part of using the t-distribution.

The t-distribution was used since the population standard deviation for number of extracurriculars is unknown for undergraduates at UMass Amherst. The 95% confidence interval shown above means that if all possible confidence intervals are created 95% of the confidence intervals will include the mean for number of extracurriculars that undergraduate students participate in at UMass.

Table 3: Descriptive Statistics for the mean happiness rating for UMass among undergraduate students for undergraduate students

Descriptive Statistics

N	Mean	StDev	SE Mean	95% CI for μ
256	7.7344	1.7712	0.1107	(7.5164, 7.9524)

μ: mean of How happy are you at what UMass

The t-distribution was also used to create the 95% confidence shown above. For all possible confidence intervals created, 95% of them will include the true happiness rating of UMass for undergraduates at UMass.

1- sample proportion confidence intervals using most popular responses for numerical data:

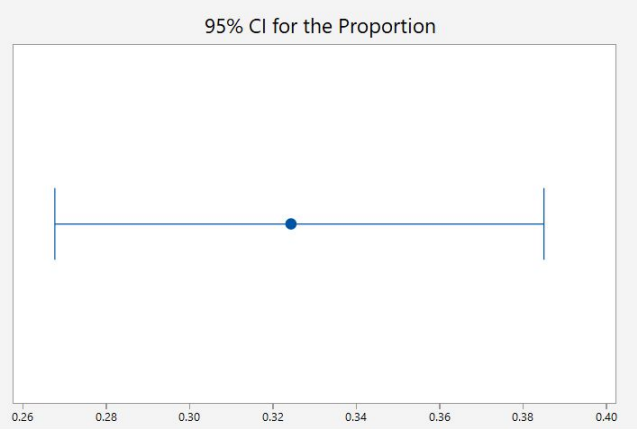
95% CI for 8 being the choice for dining hall rating for all CI tests

Table 4:

Descriptive Statistics

N	Event	Sample p	95% CI for p
259	84	0.324324	(0.267688, 0.385037)

Figure 13:



95% Confidence Interval Test for dining hall rating. According to the test our sample p falls under the 95% interval. That means that we are 95% confident that the rating for UMass dining is going to include the true population proportion for all possible CI tests that can be created. The true population proportion will show how many people rate the dining halls at UMass as an 8. The population proportion is likely around a third for rating dining halls as an 8, so this indicates that a large portion of undergraduates give dining halls at UMass a positive rating.

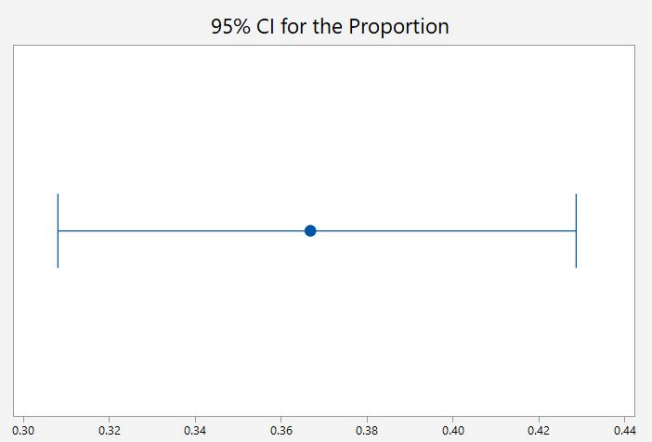
95% CI for the professor rating to be 8 for all CI tests

Table 5:

Descriptive Statistics

N	Event	Sample p	95% CI for p
259	95	0.366795	(0.308000, 0.428678)

Figure 14:



95% Confidence Interval Test for professor rating. According to the test our sample p falls under the 95% interval. That means that 95% of the confidence intervals out of all possible intervals will include the true population proportion of undergraduates who rate professors at UMass at an 8. The true population is likely to be slightly greater than one third and indicates that a significant amount of undergraduates would generally rate professors as an 8.

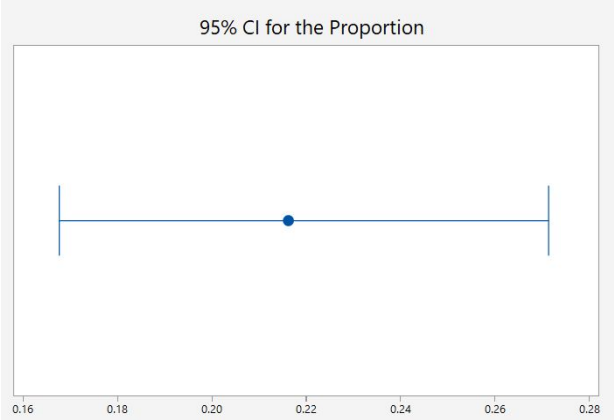
95% CI for the campus appearance rating to be 6 for all CI tests

Table 6:

Descriptive Statistics

N	Event	Sample p	95% CI for p
259	56	0.216216	(0.167657, 0.271397)

Figure 15:



The sample p falls within the 95% confidence interval. 95% of all confidence intervals will include the true population proportion for undergraduates who rate the campus appearance as a six.

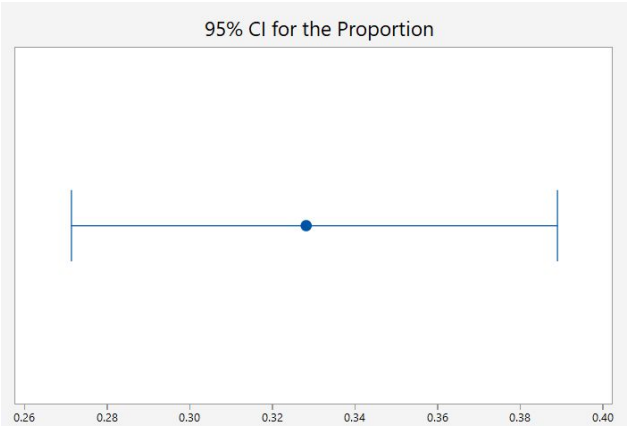
95% CI for there to be a happiness rating of 8 for all CI tests

Table 7:

Descriptive Statistics

N	Event	Sample p	95% CI for p
259	85	0.328185	(0.271332, 0.389025)

Figure 16:



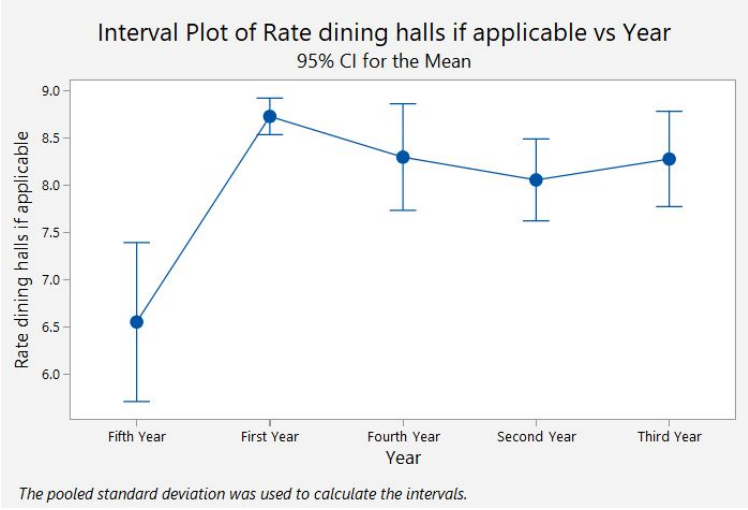
Based on the descriptive statistics, the sample p falls in the 95% confidence interval. 95% of all the confidence intervals created will include the true population proportion for undergraduates who rate their happiness with UMass as an 8. This confidence interval shows that around a third of undergraduates will rate their happiness with UMass as an 8.

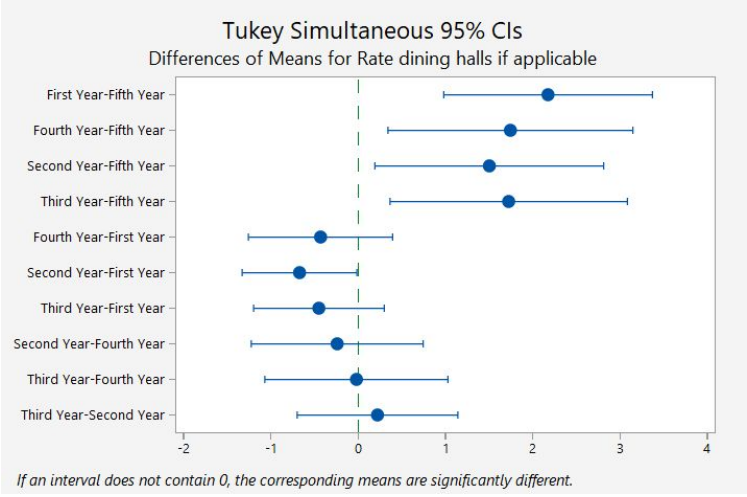
One Way Analysis of Variance (ANOVA) tests

For every one way Anova test:

Null hypothesis (H_0) = All means are equal
Alternative hypothesis (H_1) = At least one mean is different
Significance level α=0.05

Figure 17: One way ANOVA test between year and dining hall rating

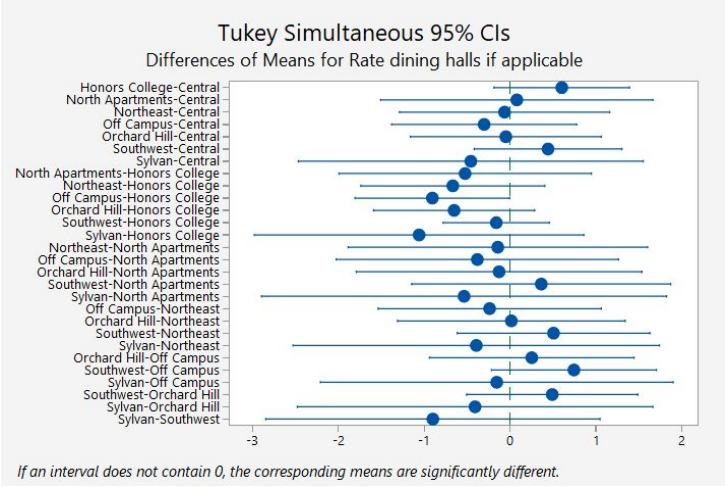


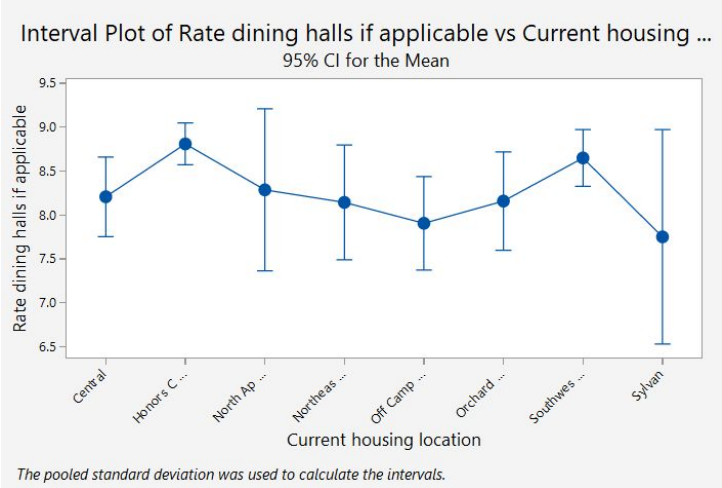


Using the one way anova test, we can see that there is a discrepancy between dining hall ratings when comparing the average rating for fifth year students with those from first, second, third, and fourth year students. The p-value is less than 0.0001, so H_0 should be rejected and a

difference does exist for fifth year students. This difference could partly be due to a smaller sample size for fifth year undergraduates that causes the average dining hall rating for this group to be less representative of other fifth year students in the entire UMass population.

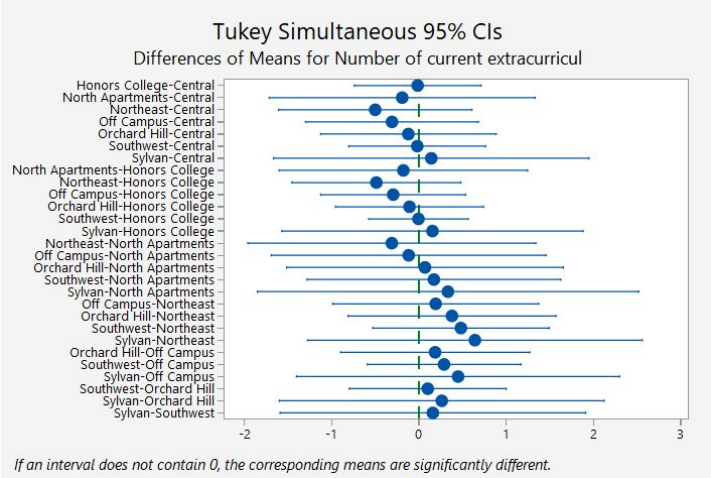
Figure 18: One way ANOVA test between living area and dining hall rating

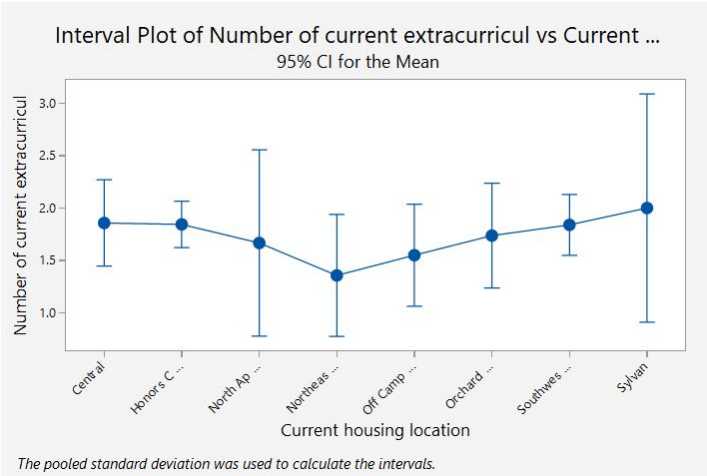




A one-way ANOVA test was completed to test whether there was a difference in ratings of dining halls depending on where the participants live. The p-value, 0.0140, is larger than 0.0001, so H_0 should not be rejected. Therefore, a difference does not exist for ratings of dining hall depending on where a student lives.

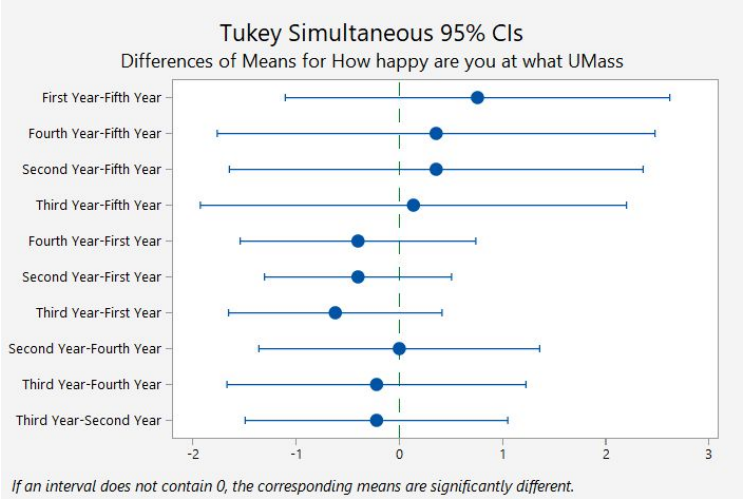
Figure 19: One way ANOVA test between living area and number of extracurricular activities

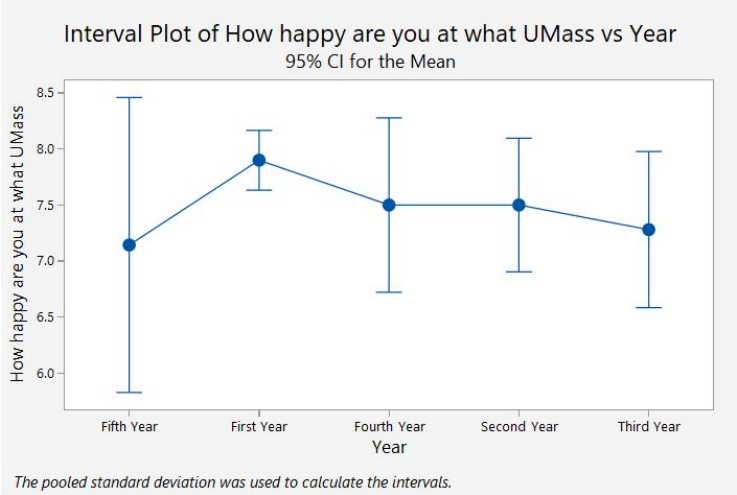




A one-way ANOVA test was completed to test whether there was a difference in number of extracurricular activities participants are involved in depending on housing location. The p-value, 0.8031, is larger than 0.0001, so H_0 should not be rejected. Therefore, a difference does not exist for ratings of dining hall depending on where a student lives.

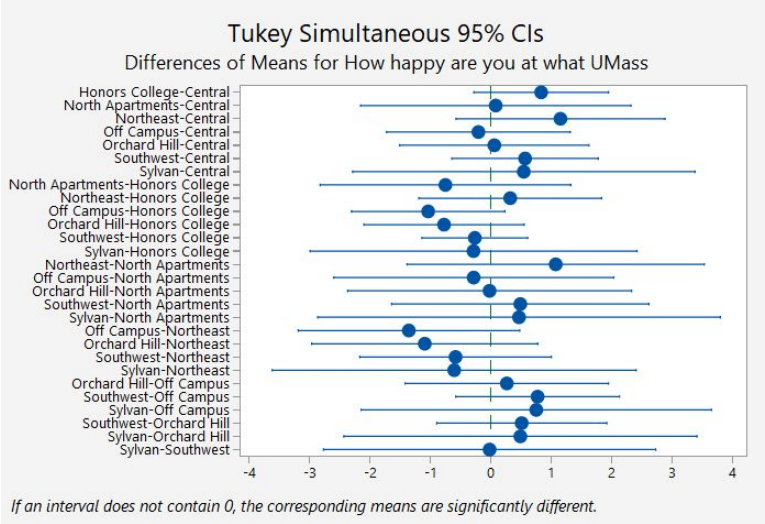
Figure 20: One way ANOVA test between year and happiness with UMass Amherst

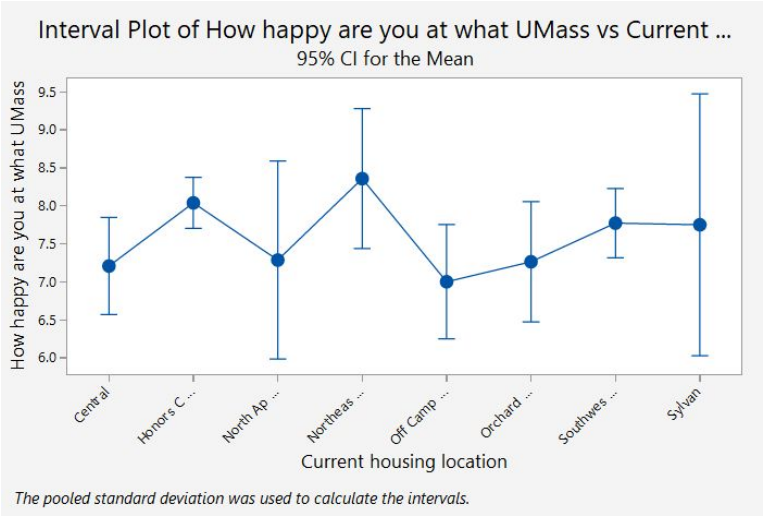




A one-way ANOVA test was completed to test whether there was a difference in ratings of happiness of participants depending on the participants' year. The p-value, 0.3033, is larger than 0.0001, so H_0 should not be rejected. A difference does not exist for ratings of happiness of students depending on how long they have attended UMass.

Figure 21: One way ANOVA test for living area and happiness with UMass Amherst





A one-way ANOVA test was completed to test whether there was a difference in rating of happiness of students at UMass depending on where the participants live. The p-value, 0.0740, is larger than 0.0001, so H_0 should not be rejected. This means, a difference does not exist for ratings of happiness depending on where a student lives.

Conclusion

We ran many tests including the chi-squared test and one way analysis of variance (ANOVA) test along with creating descriptive statistics for the mean using the t-distribution and 1-sample proportion confidence intervals using most popular responses for numerical data. We examined multiple factors that relate to each other such as the number of participants with recommending UMass to the housing location (on campus) with the happiness of UMass students. These tests we ran between two variables pertaining to the happiness and the situation(s) of UMass students. Therefore, we conclude that there is a relationship or close to a relationship between the happiness of UMass students with recommending UMass to other students, satisfaction with the UMass wifi, extracurriculars, rating an 8 for the dining halls, the campus appearance being a 6, living situation on campus, and the professor rating being an 8. Although our sample may not have been large enough to yield helpful results for many of the tests we ran, it allowed us to make some basic conclusions about undergraduates at UMass Amherst. In conclusion, undergraduate students seem rather satisfied with UMass Amherst with differences between them being rather minor in terms of how they affects students' feelings about UMass Amherst.

Based on our results, UMass Amherst is doing fairly well when it comes to keeping undergraduate students happy. This is especially impressive for a large state school as it is responsible for catering to a large amount of people from all different backgrounds. Perhaps, a larger sample size could be taken in the future or every few years to help identify what UMass Amherst is not only doing wrong, but what it is doing right. Hopefully, undergraduate satisfaction with UMass will propel the school to new heights in the coming years. Many conclusions from these surveys would simply be impossible without experimenting with a range of statistical tests. To have a knowledge of statistical tests or at least understand their benefits can help people comprehend the depth of data collection and apply what they know in everyday life.