Survey Report — Stephanie Bao, Julia Luo, Alice Zheng

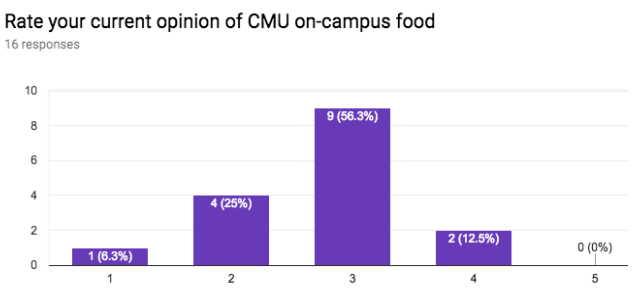
Executive Summary

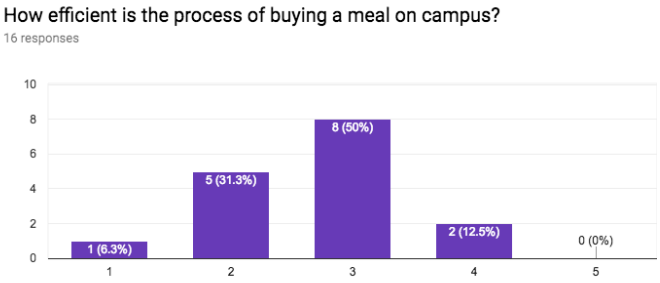
After a round of contextual inquiry and seeing what people do and use in relation to lunch, my team has moved onto surveys in order to evaluate what people say or think about lunch at CMU. Our initialize interviews showed us a lot of insight into what people prioritize in regards to eating lunch on campus. With further analysis and scrutiny, we could identify key values of eaters as well as different scenarios in which the importance of these values change. Pulling from this analysis and our data, we could see that the most common situations that posed problems were when students did not have enough time. This could be that they have too much homework, back to back lectures, or some other time consuming activity. Because of this, we devised the following goal for our survey: To evaluate the values of students based on the time related situations they are in.

Methods

To begin with this survey process, our team started with brainstorming goals and ideas. After this initial period we started narrow our broad goals into more specific goals that could be answered specifically by a survey. From our interviews we heard the word convenience frequently and in our initial design involved streamlining the ordering process of lunch. Since our scope was related to time and convenience, we decided to survey the values related to situations where time and convenience are present factors. From there we knew that we wanted to survey undergraduate students. Originally, our population was just upperclassmen students, but we ended up including freshmen for more diversity. Freshman students are a bit different since they are under a meal plan and have not fully figured out the lunch system since it is still fall semester. We received 16 total responses (2 Freshman, 3 Sophomores, 8 Juniors, 3 Seniors). We had a pretty even split of meal plan users (N=7) and non meal plan users (N=9). We distributed this survey by posting in different groups and group chats on Facebook.

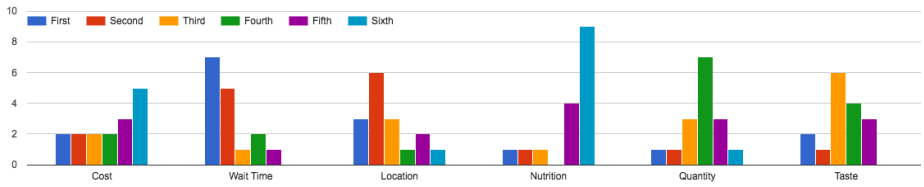
Results



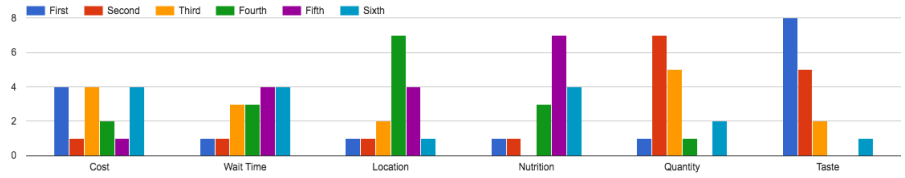


Given our small sample size, it is difficult to generalize the trend of undergraduate current opinion as well as the efficiency of the process of purchasing CMU on-campus food. Concerns aside, we see the distribution of both histograms are approximately normal but there are more values on the low end. The mean rating of 2.75 for current opinion and 2.6875 for efficiency corroborates what we see from the histograms, that the current opinion is neutral leaning towards the low end. From both visualizations, we assume that students are not very satisfied with current on-campus food and the process of buying on-campus food.

You are in a rush but want to get food. Please RANK from 1(most important) to 6 (least important) the following values in order of importance:



You are NOT in a rush and want to get food. Please RANK from 1 (most important) to 6 (least important) the following values in order of importance:



Value	Rush Mean	No Rush Mean	Difference
Cost	4.0625 (SD=1.84)	3.4375 (SD=1.93)	0.625
Wait Time	2.0625 (SD=1.29)	4.25 (SD=1.53)	-2.1875
Location	2.75 (SD=1.53)	3.94 (SD=1.24)	-1.19
Nutrition	5 (SD=1.59)	4.625 (SD=1.41)	0.375
Quantity	3.81 (SD=1.22)	2.875 (SD=1.41)	0.935
Taste	3.31 (SD=1.25)	1.875 (SD=1.31)	1.435

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        Paired t-test

data:  rushed and not_rushed
t = -0.0022022, df = 5, p-value = 0.9983
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -1.460377  1.457877
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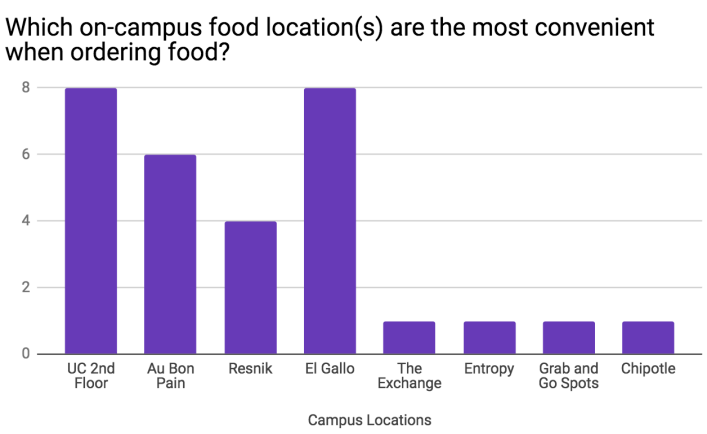
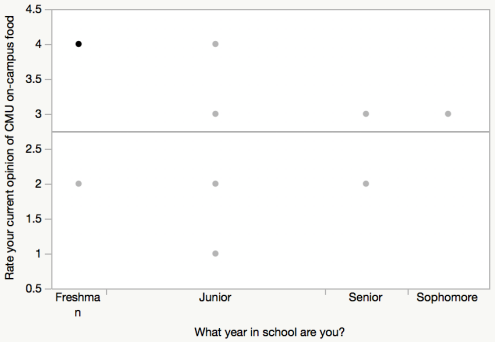
From the bar charts, we can see the specific distribution of ratings of importance of values when people are in a rush and when they are not in a rush. We averaged the rating and found the standard deviation of importance of each of the set values over the 16 participants for when the situation included a time constraint (in a rush) and when the situation did not include a time constraint (not in a rush). We also included the difference between the means in the table. On glance, we see there is the biggest negative difference in importance of Wait Time between rush and no rush and positive difference in Taste. This indicates that Wait Time matters the most when in a rush and Taste matters the most when not in a rush. The smallest difference was in Nutrition, indicating that the importance of nutrition does not change significantly regardless of rush or no rush. In order to see how significant this difference between Rush Mean and No Rush Mean is, we performed a Paired T-Test. Our P-Value of 0.9983 is very large and therefore not significant, indicating there is no evidence to say that the true difference in means is not equal to 0. However, this insignificant p-value may be due to the fact that our sample size is so small.

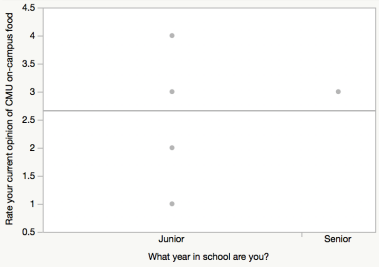


When asked for the most convenient food locations, several of our respondents gave multiple locations. We split these up and visualized the answers in the form of a bar chart. It was clear that several locations were favored (University Center and Resnik) and one respondent ignored our asking for "on-campus locations" and answered "Chipotle." We then created a word cloud to visualize the reasons behind why these locations are more convenient. The results supported our initial interviews and the ranking of values. Location and quickness were the two most prominent reasons behind convenience.

Oneway Analysis of Rate your current opinion of CMU on-campus food By What year in school are you?



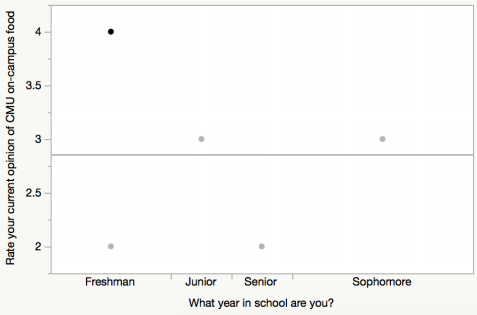
Oneway Analysis of Rate your current opinion of CMU on-campus food By What year in school are you? Are you currently on a campus meal plan (blocks and/or dinex)?=No



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
What year in school are you?	3	0.4583333	0.152778	0.2146	0.8843
Error	12	8.5416667	0.711806		
C. Total	15	9.0000000			

Oneway Analysis of Rate your current opinion of CMU on-campus food By What year in school are you? Are you currently on a campus meal plan (blocks and/or dinex)?=Yes



Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
What year in school are you?	1	0.2857143	0.285714	0.3500	0.5727
Error	7	5.7142857	0.816327		
C. Total	8	6.0000000			

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
What year in school are you?	3	0.8571429	0.285714	0.4286	0.7477
Error	3	2.0000000	0.666667		
C. Total	6	2.8571429			

We decided to test the significance in the relationship between the current opinion ratings of CMU food and the student's year in school. We conducted a one-way ANOVA test and found a p-value of 0.8843, which is less than the alpha value of 0.05, proving that there is no significant relationship between the two variables. This relationship was then broken down between meal plan users and non-meal plan users. However, by chance and because of our small sample size, all of our Freshman and Sophomores were meal plan users, while the majority of our Juniors and Seniors were non-meal plan users. We then conducted one-way ANOVA tests on the two subsets, and received p-values of 0.7477 and 0.5727 respectively. While it was expected that both subsets would still show no significant relationship, it is interesting to note the difference between the two p-values. Although not visualized above, we tested the relationship between current opinion ratings of CMU food and whether a student is on the meal plan and found a p-value of 0.642, which supports the conclusion that neither year in school or meal plan usage has a significant relationship with the ratings.

Conclusion

From our surveys we saw that our assumption of negative feelings about campus food in regards to time aligns with the survey results. Our visualizations from our questions about the students opinion about food show that are generally unsatisfied with campus food and that is not very fast. We also saw through our bar charts about being in a rush and not being in a rush is that values do seem to change based on situations. These values also pop out during the open response, and we see this through our word bubble. Words like quick, fast, close are popular and show those are what make people consider a food location convenient. Overall these extrapolations help prove to us that people have a slightly negative opinion of campus food and its efficiency. They also help us see what people *think and say* about campus food locations. We were starting to see inklings of these thoughts during our contextual inquiry, and now they are more apparent. Since the data set is quite small, we cannot validate and make strong conclusions due to sample size. However we can imply people's generally feeling and begin comparing them to facts. From here we can start evaluate if the campus food locations that are supposedly convenient to actual facts and measurements. We can look into other factors such as the meal plan and housing location. All of the sophomores in our survey were on the meal plan, what does this do to our results? If we see that there is a difference between what people perceive as fast and what is actually fast, we could involve changing perceptions of students in our redesign or adopt the practices that do actually make places fast.

Appendices

Analysis Plan

a. What you hope to learn from it
b. Technique for analyzing it
c. How data will be presented

Rate your current opinion of CMU on-campus food

a. We are looking to see the student's general opinion of CMU's food
b. A histogram to see the distribution of student opinion and a boxplot to see the median/mean/quartiles/potential outliers
c. Histogram and boxplot show distribution is approximately normal with a slight skew to the left

You are in a rush but want to get food. Please RANK from 1(most important) to 6 (least important) the following values in order of importance:

a. Looking to see the contrast in values when people are in certain situations when time is limited (which is frequent for CMU students).
b. Mean ranking and standard deviation for each value (wait time, cost, location, nutrition, quantity, taste)
c. Table with the mean and standard deviation of the ratings for when time is a constraint, when time is not a constraint, and the difference between the two

You are NOT in a rush and want to get food. Please RANK from 1 (most important) to 6 (least important) the following values in order of importance:

a. Looking to see the contrast in values when people are in a certain situation. This question is to see the difference from the previous situation
b. Mean ranking and standard deviation for each value (wait time, cost, location, nutrition, quantity, taste)
c. Table with the mean and standard deviation of the ratings for when time is a constraint, when time is not a constraint, and the difference between the two

How efficient is the process of buying a meal on campus?

a. We are looking to see people's **perception** on how their lunch experience is in relation to time
b. Histogram see the distribution of student opinion on efficiency and a boxplot to see the median/mean/quartiles/potential outliers
c. Histogram and boxplot show distribution is approximately normal with a larger skew to the left than the histogram and boxplot for current opinion (question 1)

Which on-campus food location(s) are the most convenient when ordering food?

a. Looking to find a baseline for which food locations make people think are working/convenient on campus
b. Manually grouping specific food locations into regions/categories; separating data where multiple food locations were mentioned to be individual responses.
c. Frequency histogram

What makes the location(s) you chose above more convenient?

a. We are looking to see more in depth about **why** a student associates convenience with this location. This might help us see what students are perceiving as convenient. We might also be able to compare what they say to actual facts, in order for us to see if there is a difference between perception and reality.

b. Looking at frequency of keywords that were mentioned in the responses, editing the responses to be all lowercase and removing the ones that were not informative (like “food”, “always”, and “usually”)
c. Word cloud where the size of the text indicates the number of times the word appeared in the overall data (the larger the text, the higher the frequency)

Would you pre-order campus food if it was an option?

a. Looking to see if people would have a positive reaction to the main component of our proposed solution to making campus food more time convenient
b. Look at proportion of “yes”, “no”, “other” in relation to the total number of people in the sample
c. ~~Pie chart to see distribution~~ removed(?)

What year in school are you?

a. Demographic background
b. Want to make sure we covered the entire population at interest which is undergraduates, specifically upperclassmen
c. ~~Pie chart to see distribution~~ wrote about in methods

Are you currently on a campus meal plan (blocks and/or dinex)?

a. Background information
b. Want to make sure we get a representative sample of both students who are on and off campus meal plans
c. ~~Pie chart to see distribution~~ wrote about in methods

Overall Analysis

a. Is there correlation between current opinion of CMU food and school year/being on a meal plan?
    i. Does school year affect opinion of CMU food?
    ii. One way analysis (ANOVA) of current opinion rating of CMU food vs student year by whether students are on a meal plan or not
    iii. Report the p-value for significance
b. Is there correlation between rankings of values when in a rush and not in a rush?
    i. Do values change based on time?
    ii. Paired t-test
    iii. Report p-value for significance

LINK TO SURVEY HERE:
https://docs.google.com/forms/d/e/1FAIpQLSeDgJO0FezuryGWBu1kRLtOx9ne9DYTZZJyjZPRcDlnR-_YtQ/viewform?usp=sf_link

Intro text:

“Hi there, thank you for taking our survey! We're students currently in User-Centered Research and Evaluation and we're working to improve the CMU lunch experience. Your input will help us make informed choices about our final solution. Thank you again!”