Dining Point Usage Among Undergraduate Students at Boston University

An Analysis of Preferences and Influences

CAS MA 213 Lab
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Group 1 - “First Quartile”
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Study Overview

- **Context:** Investigating how different factors influence dining point usage.
  - Focus on residence, grade level, and extracurriculars
- **Goal:** To identify patterns and correlations in dining point usage among BU students.

Introduction

Boston University operates an extensive dining point system. With an impressive selection of over 25 establishments, we recognized the potential variance in preferences among the student population due to the abundance of dining choices. As such, we decide to investigate the relationship between the most frequented dining point locations scattered across BU's campus and the potential factors influencing students' various decisions.

Hypothesis

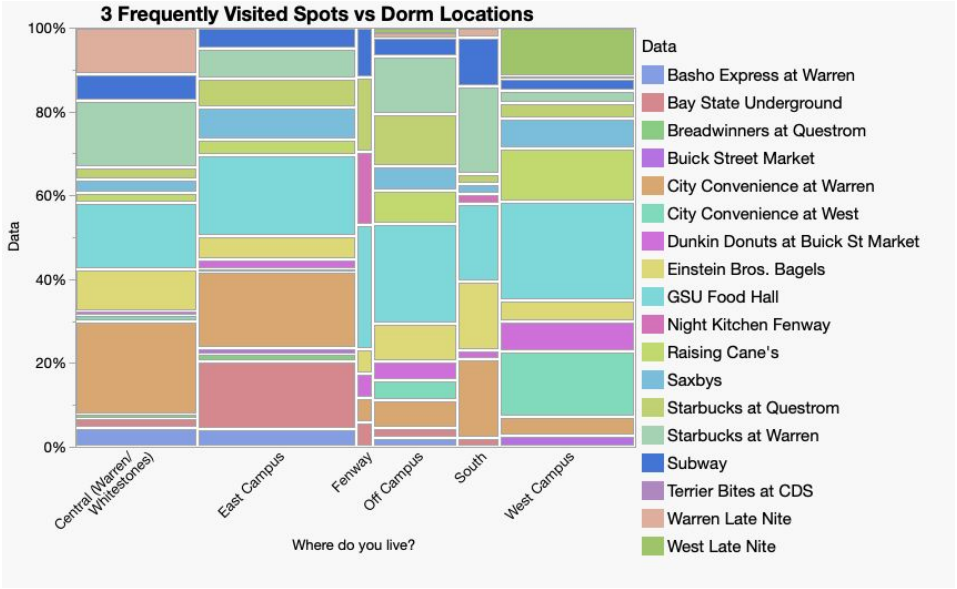
Factors that might affect students' dining points choice			
	Residence vs dining points:	Grade level vs dining points	Extracurriculars vs dining points
Null hypothesis	Where a student spends the most dining points and where their residence is are independent of one another.	Where a student spends the most dining points and what their grade level is are independent of one another.	There is no significant relationship between BU students' extracurriculars and where they choose to spend dining points.
Alternative hypothesis	Where a student spends the most dining points and where their residence is are not independent of one another.	Where a student spends the most dining points and what their grade level is are not independent of one another.	There is a significant relationship between BU students' extracurriculars and where they choose to spend dining points.

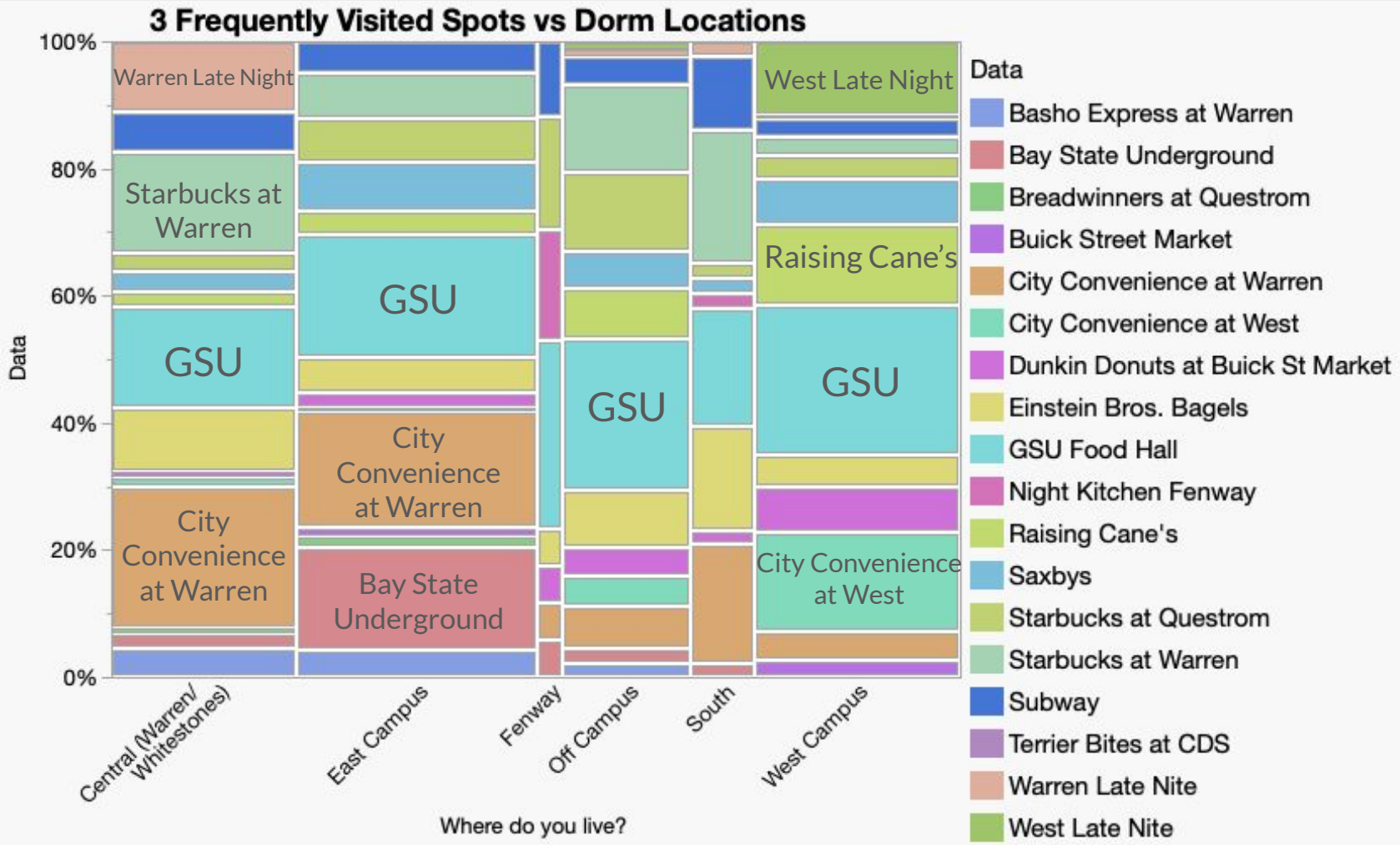
Data Collection Methodology

- Collected 208 responses from our survey
- Creating survey with quantitative questions and qualitative questions
- Publishing QR code on social media
- Investigate on focused group

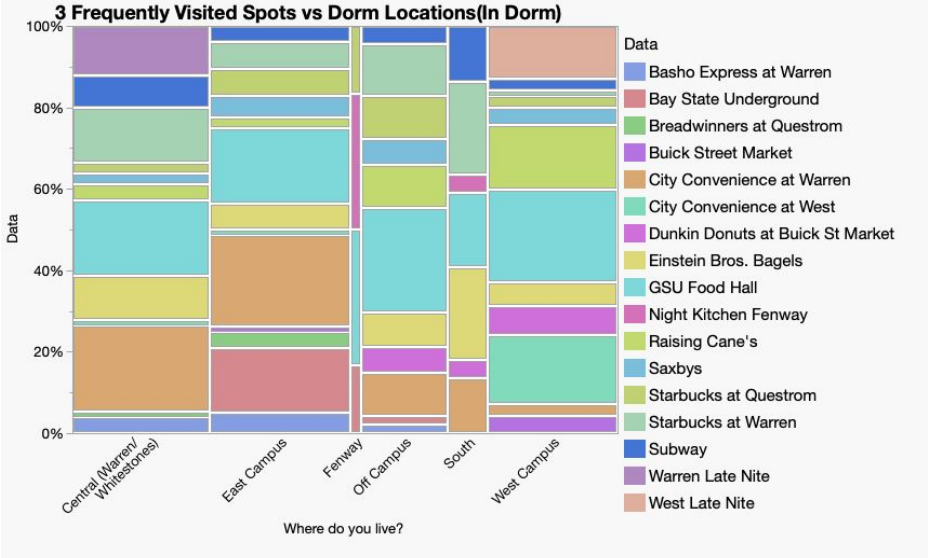
Residence Analysis: Observations

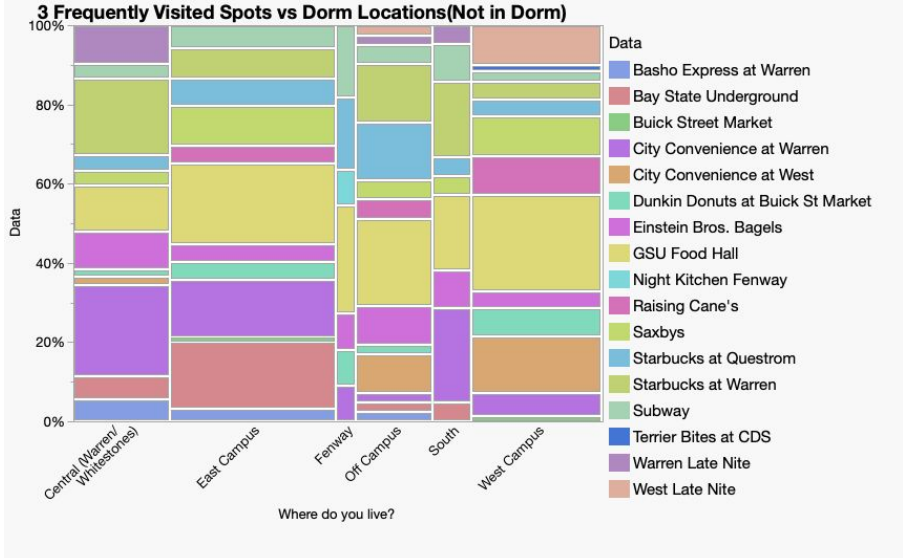
- GSU Foodhall is the largest proportion
- Students' living locations and their frequently visited dining places can be seen as dependent




3 Frequently Visited Spots vs Dorm Locations
100%
80%
60%
40%
20%
0%
Data
Warren Late Night
Starbucks at Warren
GSU
City Convenience at Warren
GSU
City Convenience at Warren
Bay State Underground
GSU
West Late Night
Raising Cane's
GSU
City Convenience at West
Central (Warren/ Whitestones)
East Campus
Fenway
Off Campus
South
West Campus
Where do you live?
Data
Basho Express at Warren
Bay State Underground
Breadwinners at Questrom
Buick Street Market
City Convenience at Warren
City Convenience at West
Dunkin Donuts at Buick St Market
Einstein Bros. Bagels
GSU Food Hall
Night Kitchen Fenway
Raising Cane's
Saxbys
Starbucks at Questrom
Starbucks at Warren
Subway
Terrier Bites at CDS
Warren Late Nite
West Late Nite

Residence Analysis: Observations





Residence Analysis: Key Findings

- P-value < 0.0001
- 0.0001 < 0.05 (α)
- Reject the null hypothesis
- Location is a dependent factor to where BU students choose where to spend their dining points.

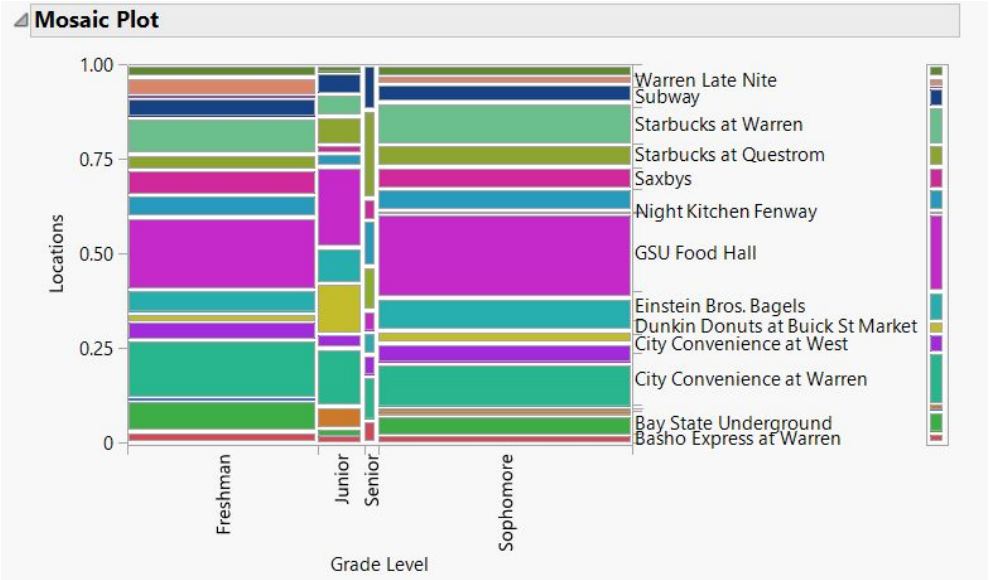
Tests

N	DF	-LogLike	RSquare (U)
580	85	165.40252	0.1123

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	330.805	<.0001*
Pearson	386.519	<.0001*

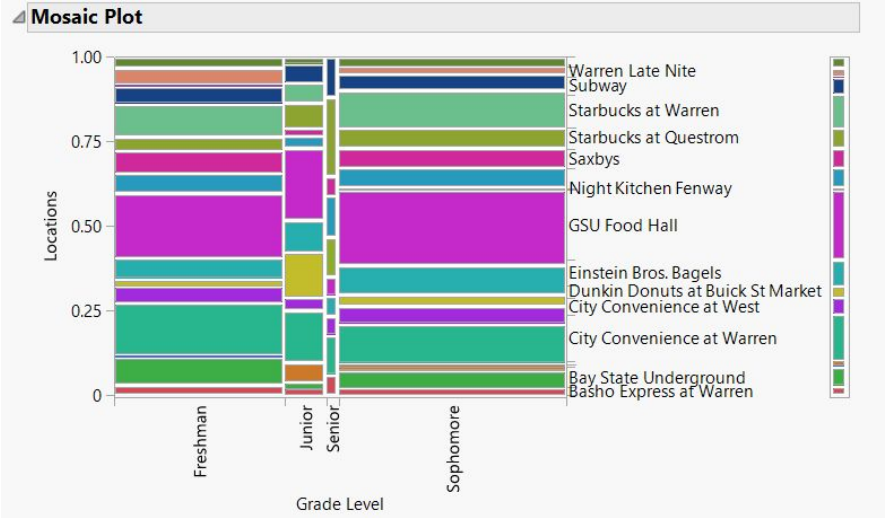
Grade Level Analysis: Observations

- The distribution between class sizes is not balanced.
- GSU is the most popular (20%)
- Junior class selections were the most centralized
- Freshmen selections lean towards central/east locations (Saxby's, City Co. at Warren, and Starbucks at Warren).

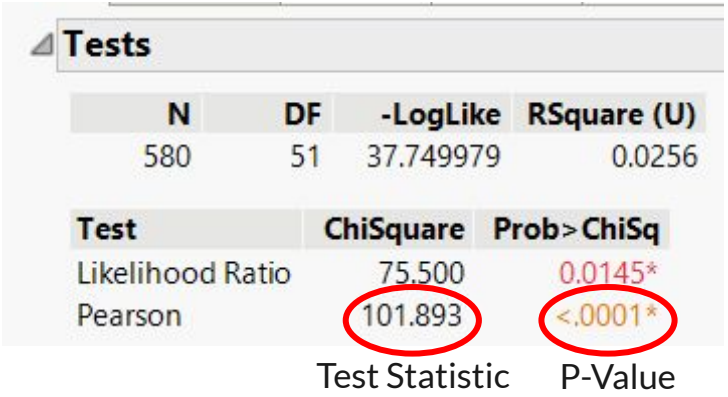


Grade Level Analysis: Observations

- Sophomore leaned more towards central and west locations (City Co. at Warren + West, Einstein Bros. Bagels, Raising Cane's)
- Senior class was mostly evenly distributed other than a good percentage choosing Starbucks at Questrom



Grade Level Analysis: Key Findings



Tests

N	DF	-LogLike	RSquare (U)
580	51	37.749979	0.0256

Test	ChiSquare	Prob>ChiSq
Likelihood Ratio	75.500	0.0145*
Pearson	101.893	<.0001*

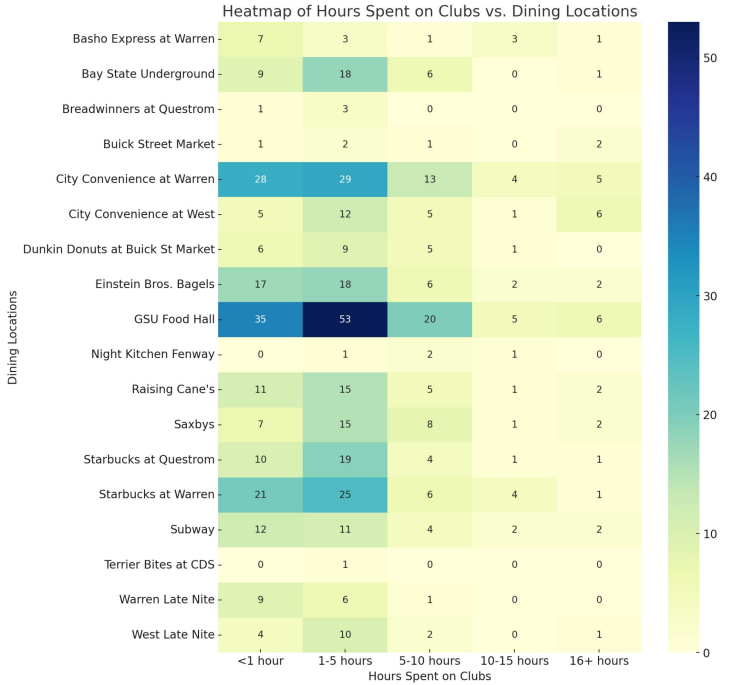
Test Statistic P-Value

We performed a chi-square test of independence at significance level $\alpha = 0.05$.

$(0.0001 < 0.05)$, we can reject the null hypothesis → we have sufficient evidence to claim that a student's grade level and where they choose to spend their dining points are not independent of one another.

Extracurricular activities: Observations

- Students involved in clubs lean towards GSU, City Co. at Warren, and Starbucks at Warren + Questrom
- Students *heavily* involved in clubs lean mostly towards both City Co.'s and GSU.



Extracurricular Activities: Key Findings

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Basho Express at Warren	15	1.80000	0.4053	1.004	2.5961
Bay State Underground	34	2.32353	0.2692	1.795	2.8523
Breadwinners at Questrom	4	1.75000	0.7849	0.208	3.2916
Buick Street Market	6	2.00000	0.6408	0.741	3.2587
City Convenience at Warren	79	2.02532	0.1766	1.678	2.3722
City Convenience at West	29	2.17241	0.2915	1.600	2.7450
Dunkin Donuts at Buick St Market	21	1.66667	0.3425	0.994	2.3395
Einstein Bros. Bagels	45	1.57778	0.2340	1.118	2.0374
GSU Food Hall	119	1.96639	0.1439	1.684	2.2490
Night Kitchen Fenway	4	2.75000	0.7849	1.208	4.2916
Raising Cane's	34	1.88235	0.2692	1.354	2.4111
Saxbys	33	2.09091	0.2733	1.554	2.6276
Starbucks at Questrom	35	1.71429	0.2653	1.193	2.2354
Starbucks at Warren	57	1.87719	0.2079	1.469	2.2856
Subway	31	1.80645	0.2819	1.253	2.3602
Terrier Bites at CDS	1	3.00000	1.5697	-0.083	6.0832
Warren Late Nite	16	1.68750	0.3924	0.917	2.4583
West Late Nite	17	2.00000	0.3807	1.252	2.7478

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Locations	17	23.3472	1.37336	0.5574	0.9225
Error	562	1384.7546	2.46398		
C. Total	579	1408.1017			

We analyzed the variance of our qualitative variables:

- H0: μ1 = μ2 = … = μn , and
- Ha: At least one pair of means (μ) is not equal.

- P Value of Variance tests = 0.9225, to compare to α = 0.05
- Since p > α, we fail to reject the null hypothesis.
- No sufficient evidence that there is a relationship between a student's extracurriculars and where they choose to spend their dining points.

Limitation

- Unequal representativeness of students from different grades.
- Limitation in controlling variables
- Inability of evaluating the validation of data
- Sample is big but not enough to estimate the whole population due to less trials

Conclusion

- Hypothesis 1: Reject the null hypothesis. → where a student spends the most dining points depends on where their residence is.
- Hypothesis 2: Reject the null hypothesis → The grade level of BU students significantly and their dining point usage are two dependent factors.
- Hypothesis 3: Fail to reject the null hypothesis → There is no significant relationship between BU students' extracurriculars and where they choose to spend dining points.