Study on Patterns in On-campus Coffee Shop: How Students Behave in the Space of Starbucks at UCSD Price Center

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Abstract

This research examines the behavior of students at the Starbucks that lies inside of the Price Center at the University of California, San Diego. The study aims to find the factors of student behavior that directly influence their utilization of the space as a coffee shop and also, as a possible community space.

The observation and recording of data was conducted at UCSD's Starbucks on Monday, March 10th, 2025, with observations at 10 AM and 2 PM, each lasting 60 minutes. The method of scan sampling was used to record drink orders, focusing on whether or not they were caffeinated, and to observe behaviors such as linger time, which was how long customers stayed after receiving drinks, and party size. Observations also included the specific times that drinks were ordered and the specific drink types that were ordered (e.g., coffee, tea, Frappuccino). The goal was to analyze patterns in caffeine consumption, drink preferences, and social dynamics among students.

The dataset recorded in total around 100 parties of orders. Cold Coffee was the most popular drink in both periods, followed by Cold Tea, Hot Coffee, and Refreshers. Caffeinated drinks were the most popular option, making up around eighty percent of both morning and afternoon orders. Smaller parties (1–2 people) lingered for mostly short times, especially solo customers (under 10 minutes), while larger parties (3–4) showed more varied linger times. Parties of 4, however, averaged 0 minutes of linger time. A weak positive correlation was found between party size and linger time. Some customers paired caffeinated drinks with free iced water, particularly with cold coffees.

The study found evidence that there is a weak positive correlation between party size and linger time, slightly supporting Hypothesis 1 that larger parties may stay longer, though

causation cannot be confirmed. Hypothesis 2, which predicted that there would be more caffeinated drinks in the morning, was not proven, as the proportion of caffeinated drinks remained extremely similar in both the morning and the afternoon. Observations also noted a bimodal distribution of linger times, as most parties either stayed for a very short period of time or for an extended period of time. While this study provides valuable insights into student behavior, future improvements could include permutation testing or larger sample sizes to further confirm and validate findings.

Introduction

Coffee is one of the most popular drinks in the modern era of an intense work and study culture. The product itself is used as a chemical energizer to help many people stay awake for them to continue their academic or work performance, and coffee shops have been shown by various literature as a “third place”, which is a social setting separate from the two usual social environments of home ("first place") and the workplace ("second place") that can lead to the fostering of a sense of community (Waxman, 2008). At many other colleges as well as UCSD, coffee shops are very popular, as many students often find themselves needing an extra boost to get through their classes and rigorous study sessions, a boost which caffeine readily provides, improving performance and increasing alertness (Smith et al., 1993). For students, a coffee shop can not only provide energy and sweet treats, but community and a relaxing space for them to unwind. Since coffee shops offer these various benefits, they are often a wealth of human interaction and contain a multitude of ways for people to interact with each other and their environment. For this reason, coffee shops are a compelling source of information to study human behavior and how behavior and environment influence each other in community spaces.

For this research project, we would like to observe some patterns in UCSD student's beverage consumption and our question is as follows: **What are the factors that influence the pattern of behaviors UCSD students engage in at the Starbucks coffee shop?**

We find this question important and worth exploring because we would like to understand how students behave in an important "third place" to provide specific insight into how students interact with their environments and to infer broader student behaviors and social patterns. We would like to see how a student's role in the university may potentially influence and shape their use of coffee shops when it comes to their decision-making and social or non-social behavior in the community space that is a coffee shop. Factors that we would like to observe include the exact time of the order being called, what type of drink people order, whether or not the drink they order is caffeinated, if they stay longer after receiving their drink or just get their order and leave, and exactly how big their party size is. As mentioned above, various literatures have shown that coffee shops can serve as an important place for socialization (Pelau & Radulescu, 2019). Based on the research question outlined above, the following hypotheses are proposed:

Hypothesis one: People will be more likely to stay longer at Starbucks when they're a part of bigger parties, as they will socialize and end up hanging around for some amount of time. Prior studies indicate that coffee shops can be considered hubs of socialization: "For many people, the coffee shop serves as a third place, a place to regularly interact with fellow community members" (Waxman, 2008). Therefore we hypothesize that individuals who attend coffee shops alone likely have less motivation to stay, while bigger groups might linger for the sake of socializing.

Hypothesis two: People will get more caffeinated drinks in the morning, and less caffeinated drinks after lunch. Prior studies have shown data for when average people drink

coffee in the day. The paper “Coffee Consumption Patterns in a Hurried Society” includes figures demonstrating people drink coffee the most before and after breakfast in the morning, with lunch being a popular time to drink coffee as well, but less popular than in the morning (Pelau & Radulescu, 2019). We specifically speculate that UCSD students will drink less coffee right after lunch since they would not need the caffeine to wake them up as much as they would need it in the morning.

Method & Measurements

This study will be conducted in UCSD’s Starbucks in Price Center, on a random weekday. The chosen weekday for this study is on Monday on March 10th where we will be conducting several different observations: Once in the morning at 10 AM, and once at 2 PM– the latter being the observed busiest time, each observation period taking 60 minutes. We will be positioning ourselves close to the counter so that we can easily observe which drinks students order to ascertain whether or not the drinks they have ordered contain caffeine. The procedure will involve sitting at a table as close to the Starbucks counter as possible and quietly performing scan sampling to pay close attention to what people order and to make observations that capture the wide range of factors that the crowd of the student body at Starbucks could present. Scanning observations are appropriate here, since we would like to grasp a holistic view of many samples to find patterns and trends, and it is also the best method for observing groups.

The behavior coding scheme is described below.

- [**Date**]: The date the observation was performed. Both observations were conducted on the same day, which is March 10th, 2025.

- [**Weekday**]: The day of the week the observation is done. We chose weekdays because Starbucks is busiest during the week compared to the weekends, therefore providing us with a good sample size and a possible good variation of all sorts of behaviors. This observation was done on Monday.
- [**Time of Order**]: The time that a Starbucks employee calls the order and the person's name, signifying the order being done; it will be recorded in military time.
- [**Type of drink**]: The type of drink the person ordered off the Starbucks menu. We can use this to analyze several attributes, e.g. whether it's caffeinated, whether students prefer seasonal drinks, the size of the drink, and so on. We will ignore all add-on requirements, except decaf or not. The code here will include the entire Starbucks menu, from drinks to food. The types here will correspond to Starbucks' official classifications of drinks, seen here. We will also only include freshly made drinks and ignore bottled beverages.
    - Drinks: [**Hot Coffee, Cold Coffee, Hot Tea, Cold Tea, Refreshers, Frappuccino Blended Beverage, Iced Energy, Hot Chocolate, Lemonade & more**]
- [**Caffeinated**]: We will document whether or not the drink people ordered is caffeinated. This can potentially imply whether people order drinks for the taste or to keep themselves energized to study.
    - [**Yes**]: The drink is caffeinated
    - [**No**]: The drink is decaf or does not contain caffeine
- [**Linger Time**]: How long does the party stay after getting all their drinks? Different from the wait time, this time is calculated for how long the group stays even after their

drink is done – do they stay around to sit and study? Linger time will be counted in minutes.

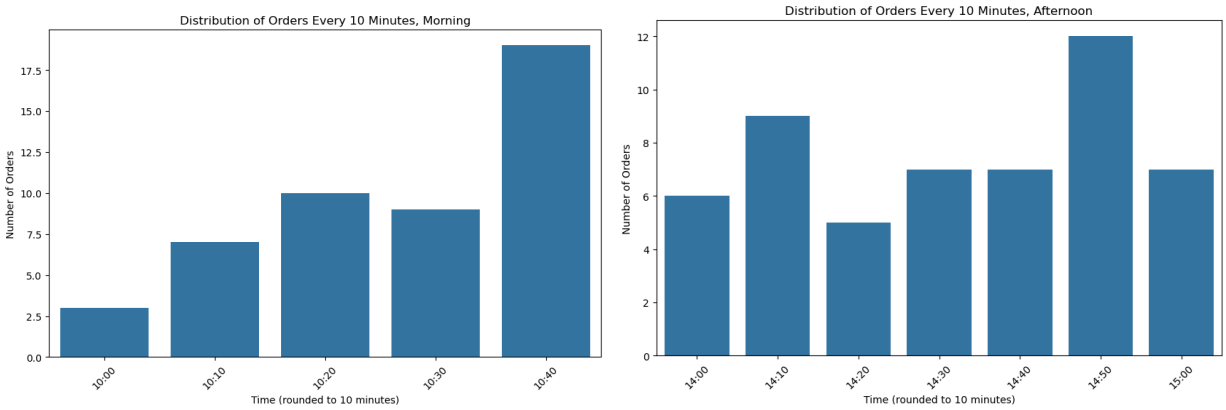
  - Example: [**5**]: The party/individual has stayed in Starbucks after receiving their drink(s) for five minutes.

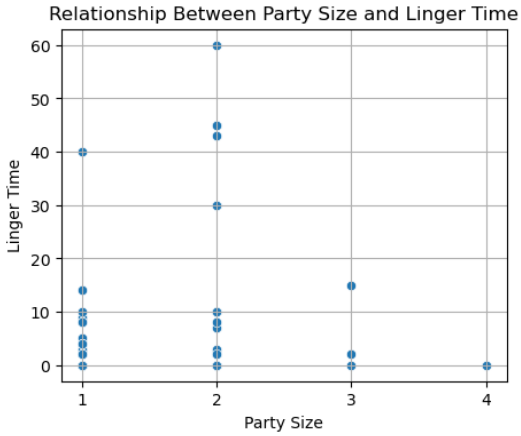
- [**Party**]: Numeric value of how many people came together. It can be used to perform linear regression to see if there is a correlation between whether a bigger party will correlate to more socializing and, therefore, more lingering time. A single person will be coded as 1, two people will be coded as 2, three people will be coded as 3, and so on.
  - Example: [**1**]: When one person is ordering and receiving their drink alone.

Results

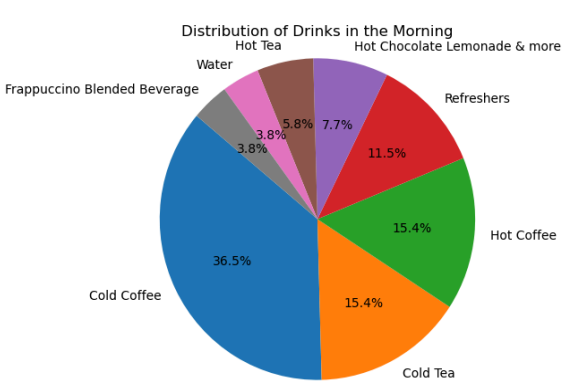
There were 49 orders in the morning (10–11 am) and 54 orders in the afternoon (2–3 pm). The total number of drinks ordered in the morning was 53 and the total number of drinks ordered in the afternoon was 77. The morning orders were concentrated toward the end of the hour, while the afternoon orders were more evenly distributed, as shown below. Smaller parties (1–2 people) typically lingered shorter times, especially parties of 1 (mostly under 10 minutes). Larger parties (3–4) had more varied linger times. Parties of 4, however, stayed for an average of 0 minutes, which can also be seen in the count plot attached. Parties of one mostly lingered when they were paying attention to their mobile device. Most parties of 2 that lingered were seated and studying as we observed, but some lingered only to wait for each other's drinks. Running Pearson's correlation on our data gives a weak positive correlation coefficient of 0.2888, with the

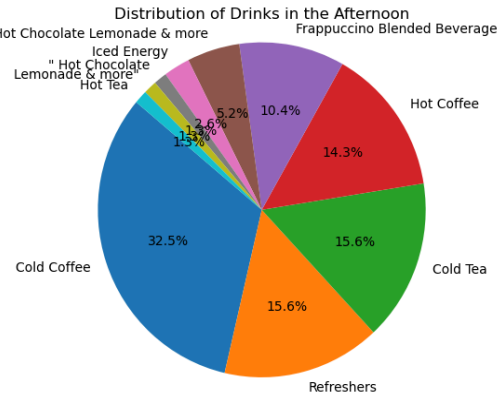
calculation attached in the supplementary notebook.



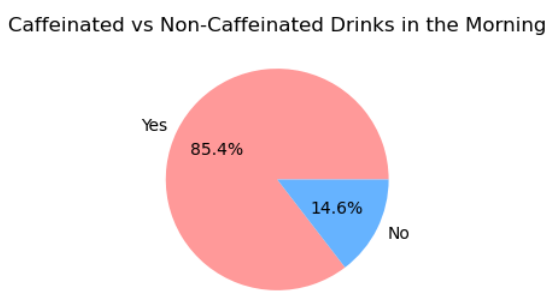


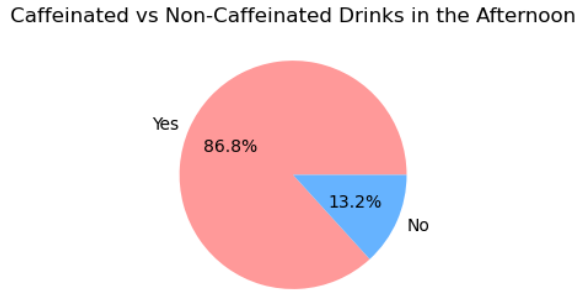
In both the morning and afternoon, [Cold Coffee] was the most popular beverage of choice, constituting 36.5% and 32.5% of the orders respectively. Cold Tea, Hot Coffee, and Refreshers consistently remained the secondary most popular drinks, each taking up around 10% to 15% of overall drinks ordered. We also observe an interesting phenomenon where certain individuals would get a free cup of iced water to go with their caffeinated drinks, mainly cold coffees.





The amount of caffeinated beverages versus non-caffeinated beverages was largely similar for the morning and the afternoon. In the hour between 10 and 11 am, caffeinated beverages were 85.4% of the beverages ordered while non-caffeinated beverages were 14.6% of the beverages ordered. In the hour between 2 and 3 pm, 86.8% of the beverages ordered were caffeinated, while 13.2% of the beverages ordered were non-caffeinated.





Discussion

From all of the data collected above in the Results section of this research paper, we can draw a few conclusions about the hypotheses that we had previously constructed. Recall our very first hypothesis:

Hypothesis one: People will be more likely to stay longer at Starbucks when they're a part of bigger parties, as they will socialize and end up hanging around for some amount of time.

Our result indicates that there is a weak positive correlation between party size and linger time. Therefore, there is indeed a chance that an increase in party size could possibly correlate to people staying longer, but a causation relationship cannot be concluded from the available data. Now recall our second hypothesis:

Hypothesis two: People will get more caffeinated drinks in the morning, and less caffeinated drinks after lunch. Our result indicated a conclusion that went against this hypothesis, showing that there is no significant difference between the proportion of people's choice of caffeinated and non-caffeinated drinks in the morning and in the afternoon.

There are some other interesting things we observed, for example, the time between 2 - 3 PM in the afternoon was shown to be the busier session in comparison to the time between 10-11 AM in the morning. During the first thirty minutes of our observation in the morning, most seats in Starbucks were taken, but lots of people came and went, so the space was mostly empty. There were a decent amount of mobile orders, and people usually picked their drinks up fairly quickly. In the last 15 minutes of observation, there started to be a long line of people ordering, and many of them were scattered around, waiting for their drinks. In the afternoon, the coffee store was extremely packed. The majority of people were waiting for their order, as all the possible seats inside of the Starbucks were taken, and therefore many people were standing around the space, unable to sit down. Accordingly, the noise level significantly increased in this case, and there was a longer wait time for people to receive their drinks, especially when ordering in bigger groups.

The drink preferences of the students were also interesting to analyze and observe. Although many people were getting hot coffee, not many seemed to enjoy the idea of hot tea for both stretches of time. In the morning, more people ordered hot chocolate than Frappucino, while

in the afternoon, Frappucino orders outnumbered hot chocolate orders. Compared to the morning, people also ordered a bit more of a variety of drinks in the afternoon.

As far as our observation and analysis go, there is still space for improvement in the future that is hard to achieve with the current time limit. Since our observation session was short and the sample size is relevantly small compared to the potential proportion of the student body at UCSD who would go to Starbucks and order a drink, we could perform permutation testing to see whether or not the morning and afternoon caffeinated drink proportion come from the same distribution; we could also create hypothesis test to inspect more closely into the correlation between linger time and party. One issue that we might encounter is that we possibly could not use the mean of the linger time as a test statistic, since observing the data shows us that most parties either stay for long periods of time or stay for a very short amount of time, ranging from the entire span of observation (60 - 45 minutes) to 0 minutes (no linger time at all), thus the distribution of linger time can be bimodal. For now, the current observations and analysis provide valuable insights, and the results we have gathered are nonetheless still useful for drawing conclusions.

References

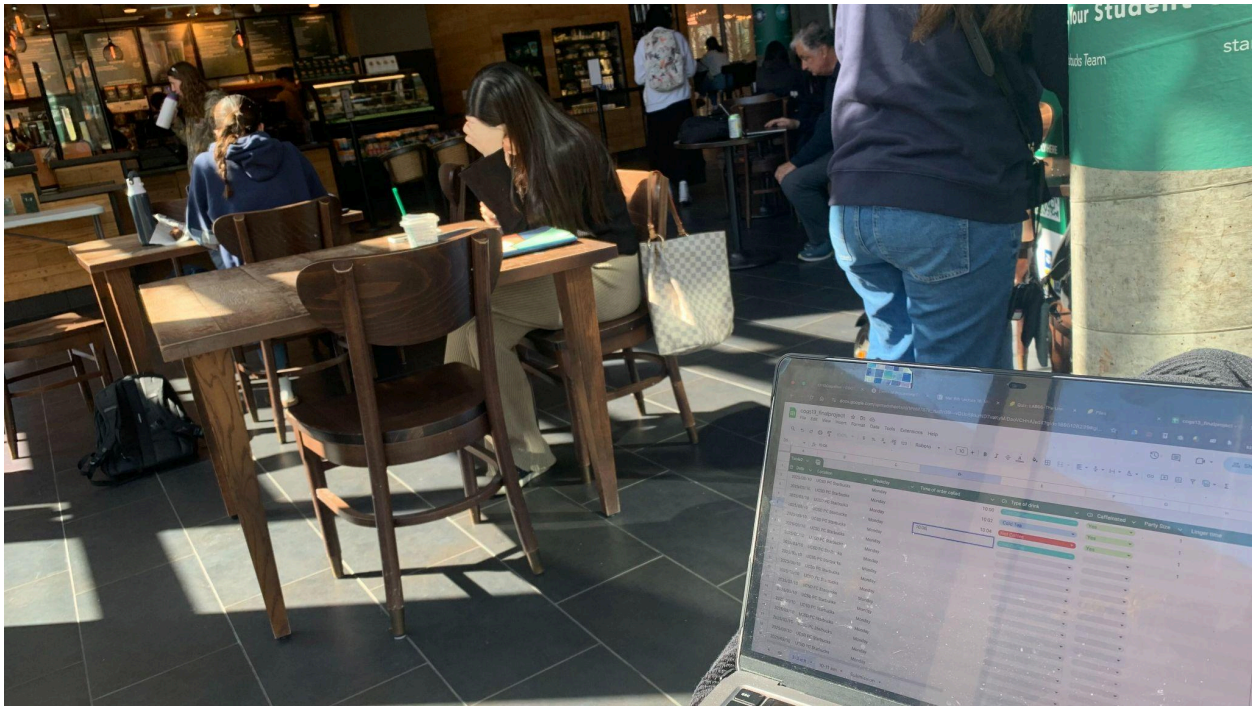
Pelau, C., & Radulescu, L. (2019). Coffee Consumption Patterns in a hurried society. *Collaborative Research for Excellence in Economics and Social Sciences*, 240–248. https://doi.org/10.2478/9788366675322-028

Smith, A. P., Brockman, P., Flynn, R., Maben, A., & Thomas, M. (1993). Investigation of the Effects of Coffee on Alertness and Performance during the Day and Night. *Neuropsychobiology*, *27*(4), 217–223. https://doi.org/10.1159/000118984

Waxman, L. (2006). The Coffee Shop: Social and physical factors influencing place attachment. *Journal of Interior Design*, *31*(3), 35–53. https://doi.org/10.1111/j.1939-1668.2006.tb00530.x

Supplementary Materials

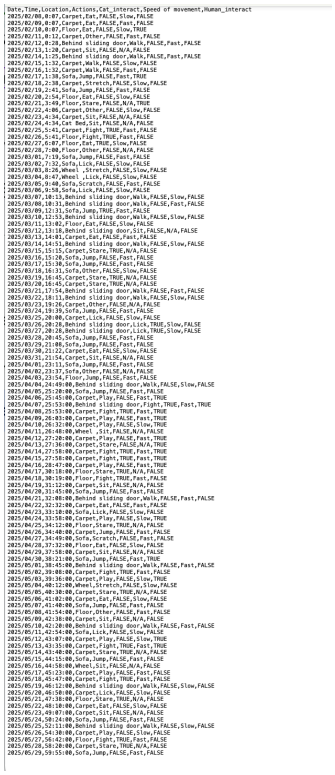
1. Full data collection: Cogs13_finalproject: Study on Patterns in On-campus Coffee Shop: How Students Utilize the Space of Starbucks at UCSD Price Center data collection
2. Proof of data collection:



3. Supplementary repository with data analysis notebook:

   https://github.com/rcwoshimao/Campus-Coffee-Space-Utilization/

4. CSV:



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