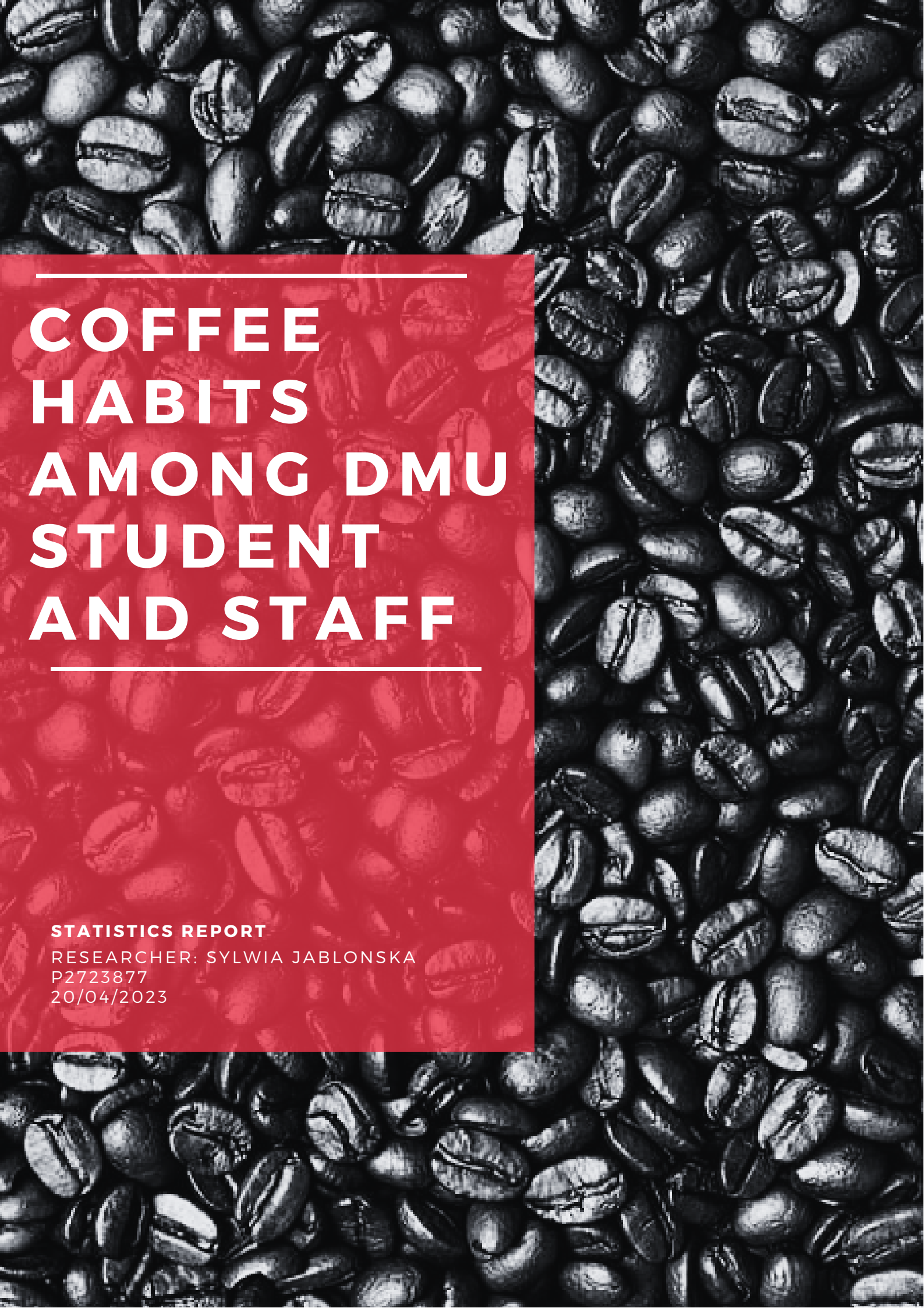

COFFEE HABITS AMONG DMU STUDENT AND STAFF

STATISTICS REPORT

RESEARCHER: SYLWIA JABLONSKA
P2723877
20/04/2023

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

The report presents the findings of a study conducted to examine the coffee habits of students and staff at De Montfort University. The online survey obtained demographic and general information about participants' preferred drinks, satisfaction in coffee habits, monthly expendable budget as well as caffeine preference and way of obtaining the drink. The initial hypothesis stated no significant difference in amount of drink obtained by staff and students, average starting drinking coffee age would be higher among non-natives and satisfaction in coffee habits would be higher among coffee drinkers. All hypotheses got disproven. From data obtained is shows that latte is most preferable drink, 75% of participants prefers their first drink to be caffeinated and average coffee consumption is lower among students. Evaluation and future recommendation are also included in the paper for deeper understanding of conducting primary research.

INTRODUCTION

British Coffee Association (2023), reports that approximately 98 million cups of coffee are consumed daily in the United Kingdom (UK), contributing over 9 billion pounds into the economy annually. Coffee has become a vital component of the daily routine for many individuals, including De Montfort University (DMU) students and staff. Understanding their coffee habits can provide insides of lifestyle choices, productivity levels and overall well-being. Furthermore, this study may inspire other researchers to explore specific areas, such as correlation between learning style and drink of choice or average grades with relation to caffeine/non-caffeine drink preference.

This paper, however, focuses on overall coffee drinking habits and preferences among DMU students and stuff in relation to nationality, monthly expendable cash, and age. The primary objective of this report is to present statistical analysis of both pilot survey and main questionnaire with particular emphasis on demographics, drink preferences, caffeine intake, average daily consumption, satisfaction, and motives for purchasing coffee. Additionally, this report analyses the average starting age in regard of nationality, examines the monthly coffee spending and acquisition methods of students and staff, and provides a critical evaluation of the research while recommending future areas of investigation.

PILOT SURVEY OVERVIEW

The purpose of the pilot survey is to evaluate the questionnaire design and data collection methods prior to the full survey, thereby enabling the identification of any potential problems or ambiguities in the survey.

The pilot survey for this study comprises of 4 participants, equality distributed among DMU students and staff via online questionnaire. For survey details including sample characteristics, refer to **Appendix A**. Demographic analysis and data method initially planned to be performed on the final survey are detailed in **Appendix B**.

As result of pilot survey, changes were made for both questionnaire and researcher approach. Question 7 initially asked for amount of all hot drinks drank per day, however after feedback from participating tutor it has been divided into two separate questions including both coffee and non-coffee drinkers. For similar reasons, question 15 asking about overall satisfaction in drinking habits has been divided for inclusivity of non-coffee drinkers. Additional feedback stated unclarity of question 10 and 11. Instead of “decaf” and “non-decaf” options, it is asking for “decaf” and “caffeinated” preference. Furthermore, option in question 11 was rephrase to “making it yourself” from “homemade” to ensure clarity of the question.

Upon gaining more experience with the analytic software used to conduct this paper, the planned analysis where not possible with the collected data as most of it were categorical. For more detailed final evaluation of type of data obtained in main survey refer to **section 14 Evaluation and recommendations**.

In conclusion, the pilot survey allowed for detailed correction and clarification of the questionnaire, however planned analysis was not possible with type of data obtained in final survey.

DEMOGRAPHICS

This paper presents an analysis of a sample size consisting of 32 participants, comprising both pilot and main survey participants. Of the 33 individuals who submitted responses, one input had to be excluded due to missing variables. **Figure 1.1: Tally for Demographics** represent all demographic data gathered in this research. The aim was to gather data about both DMU students and stuff, their age, gender identity, expendable cash and whether they are English native or not.

Tally for Discrete Variables: DMU Student/Staff, Age, ... English native?

Tally

DMU Student/Staff	Count	Percent
Staff	15	46.88
Student	17	53.13
N=	32	

Age	Count	Percent
<20	6	18.75
21-24	8	25.00
25-30	6	18.75
31-39	4	12.50
40-55	4	12.50
55+	4	12.50
N=	32	

Gender	Count	Percent
Female	14	43.75
Male	14	43.75
Non-binary	4	12.50
N=	32	

Expendable cash per month	Count	Percent
£0-500	9	28.13
£1001-1500	6	18.75
£1500+	5	15.63
£501-1000	11	34.38
Prefer not to disclose	1	3.13
N=	32	

English native?	Count	Percent
No	15	46.88
Yes	17	53.13
N=	32	

FIGURE 1.1: TALLY FOR DEMOGRAPHICS

DEMOGRAPHICS

In the final survey participates comprised of 15 (46.88%) staff members and 17 (53.13%) students which shows that distribution of survey was monitored, and equality dispensed to get the fairest data possible. Overall, 43.75% (14) of all participants were female, the same number were male and 12.5% (4) were non-binary. Following, 17 (53.13%) out of 32 participants were English native and 15 (46.88%) were not. From six age groups 18.75% (6) were in both below 20 and 25-30 years old, 25% (8) are between age of 21 and 24. Remaining three age groups, 31-39, 40-55 and 55+ all count 12.50% (4) participants in each. Lastly, associated were asked to provide information about their monthly expendable cash. One individual (3.13%) prefers not to disclose that question. From the remaining, 9 (28.13%) has £0 to £500 of expendable cash, 11 (34.38%) has £501 to £1000, 6 (18.75%) has £1001 to £1500, and 5 (15.63%) of all participants has more than £1500.

To summarise, the demographic proportions in this study were balanced enough to provide fair results. However, the small sample size limits the strength of the study's conclusions regarding coffee consumption habits among DMU students and staff. Nonetheless, it provides a general overview of the demographics involved.

DRINK OF CHOICE

When conducting a study on coffee habits and preferences among a group, it is essential to inquire about the drink of choice. This information can be used by marketing teams to promote popular drinks, managers to manage stock more effectively, and researchers to identify subgroups in their sample unit and deepen their research. There are many possible usages of this data, which is why this paper analyse it firstly.

Question gave participants multiple choice from standard hot drink types. From **Figure 2.1 Bar chart for Drink of choice** Latte is favourite drink among DMU students and staff with 16 participants choosing it as one of their preferred. Hot chocolate (13) and tea (12) were second most selected option. It is worth noting that coffee drinkers do not necessarily exclude other hot drinks from their preferences, and non-coffee drinkers were included in this survey, which may lead to an incorrect interpretation of the data. **Section 14: Evaluation & recommendations** provides more information about the mistakes made during this survey.

10 participants chose Cappuccino, and 9 selected Flat white as their preferred drinks. These data provide sufficient evidence of personal preferences, as both cappuccino and flat white are variations of latte with different proportions and ratios. (Unlike Americano, which will be discussed in next paragraph).

DRINK OF CHOICE

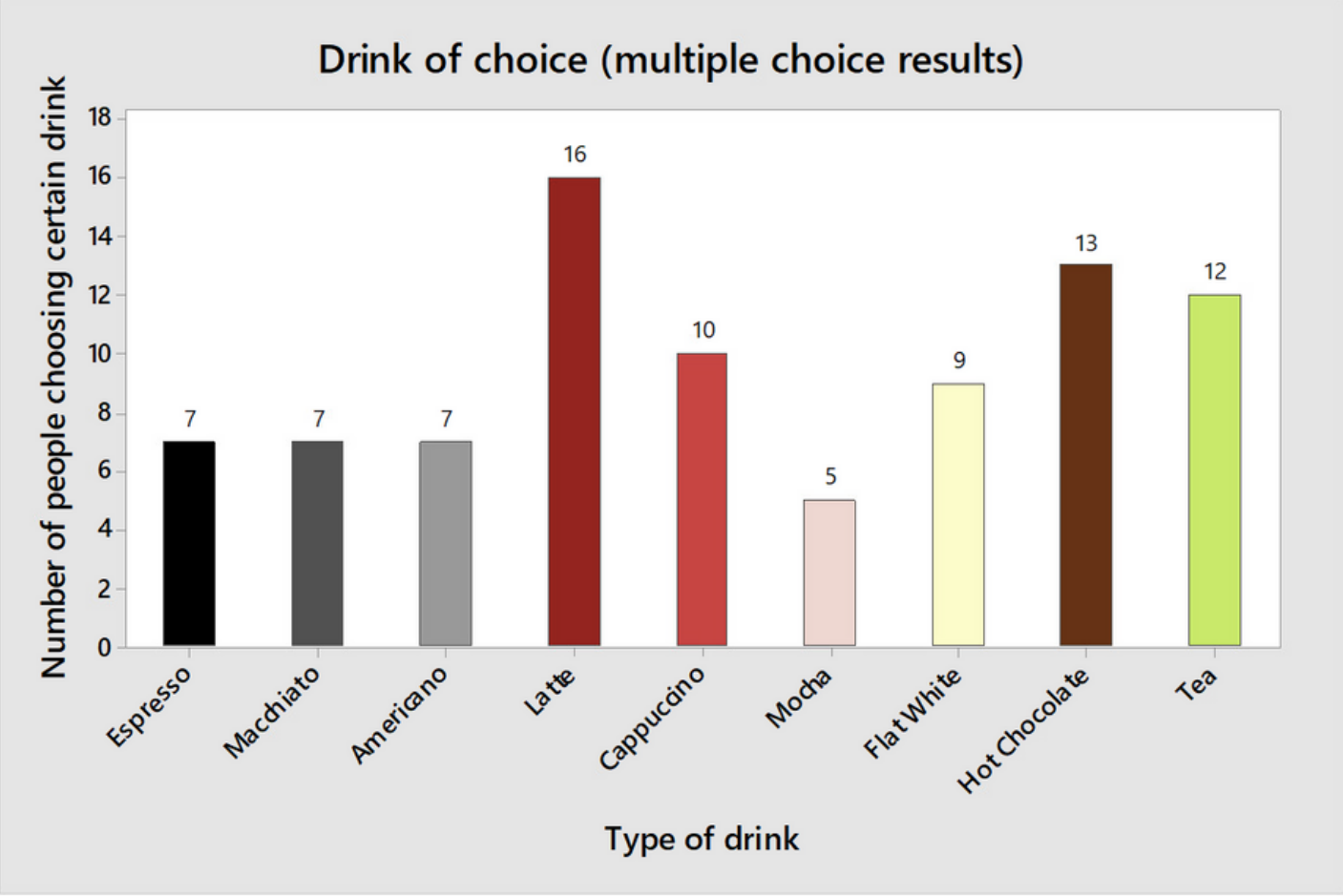

FIGURE 2.1: BAR CHART FOR DRINK OF CHOICE

Only 7 participants selected Espresso, Macchiato and Americano respectfully as their drink of choice. As these options have little to no milk, they are not a preferred choice for everyone. The data show that majority people prefer their coffee with a 1:4 ratio of coffee to milk. On contra7 out of 32 participants choosing their coffee black. However, due to mistakes made by the researcher, this cannot be confirmed, as discussed in **Section 14: Evaluation & recommendations.**

DRINK OF CHOICE

Finally, Mocha was the least favourite drink, which is essentially hot chocolate with shots of espresso. This data is unexpected, given the trend for milky choices among participants and the high ranking of hot chocolate. The low preference for Mocha may be due to its typically higher price or extra preparation steps required compared to other drinks.

As mentioned before, there are multiple ways of interpretating this information and if collected correctly can lead to valuable insights. From what was obtained in this research the preference for milk-based drink is strong. However, there is a trend among group of 7 participants for non-milk drink which suggest that approximately 22% of DMU student and staff chooses coffee without milk. For non-caffeine drinks both hot chocolate and tea got close number of votes. When conducting study at a British University the high number of tea drinkers is not surprising as tea drinking culture is still cultivated in UK. As for hot chocolate, it may be additional input as question was multiple choice, not favourite drink per se.

CAFFEINE VS DECAF

Caffeine is a stimulant naturally found in many plans, fruits, and beans (Harvard School of Public Health, 2023). It is used in sports to boost athletes' performance as well as in everyday routine of many average consumers to function properly in the mornings. This section of the paper analyses caffeine and decaf preference among all participants studied in this research.

Figure 3.1 Pie Chart for Caffeine/Decaf preference shows strong preference for the first drink to be caffeinated. With 75% of participant choosing caffeine intake with their morning coffee/tea and 15.6% choosing decaf. The 9.4% choosing both are the consequence on changes in pilot survey and summarization with data from the final survey. Refer to **section 3: Pilot survey** for changed done to the study. It was not surprising to find such a preference for caffeine, given that coffee is often consumed for its energizing effects.

In conclusion, 3 out of 4 of participants prefers their first drink to be caffeinated. The 15.6% whom prefers their drink to be decaf might not have caffeine at all as question ask for first drink of the day.

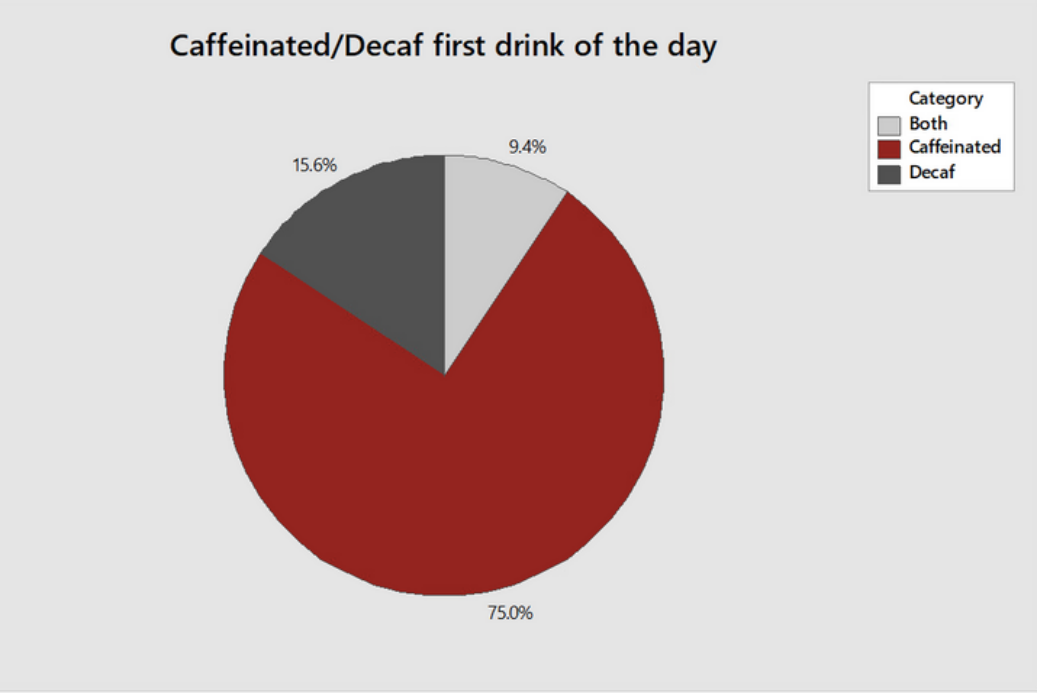

FIGURE 3.1: PIE CHART FOR CAFFEINE/DECAF PREFERENCE

AVARAGE DAILY CUP CONSUMPTION

Another crucial aspect when studying coffee habit is to analyse the number of consumed cups of drink per day. Students and staff were asked to insert the average number they have daily. It was an open question and participants had to insert value from 0 to 100. The aim of this paragraph is to analyse obtained data.

Figure 4.1 Summary report for daily coffee cups intake for Staff and **Figure 4.2 Summary report for daily coffee cups intake for Students** present graphical summary of obtained data in this question. With mean value of 2.8 and standard deviation of 1.37 among Staff and 2.4706 mean value and 1.84 standard deviation among Students, it can be said that average coffee consumption among both group is approximately 3 cups per day. To confirm this hypothesis testing has been performed (**Figure 4.3 One-sample hypothesis testing: Staff and Students cups/day**)

Taking null hypothesis was that average number of cups consumed by both groups was 3 cups per day. The alternative hypothesis was that the average number of cups consumed by at least one group was different from 3 cups per day.

AVERAGE DAILY CUP CONSUMPTION

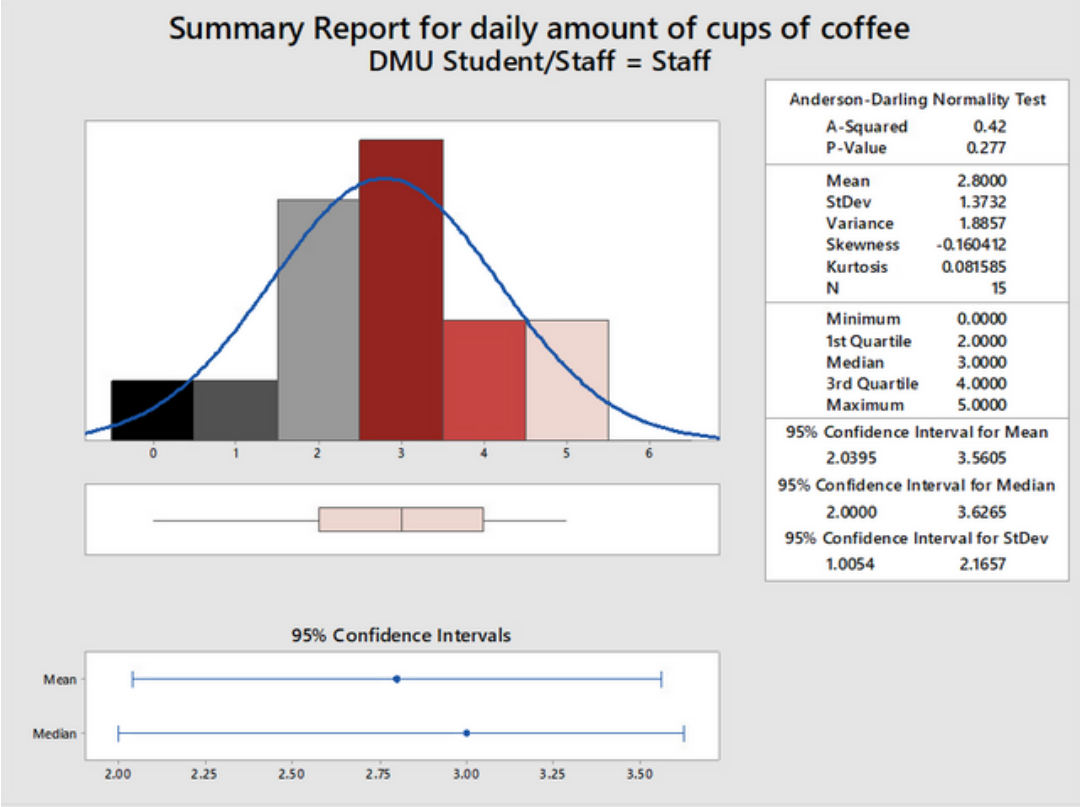

FIGURE 4.1 SUMMARY REPORT FOR DAILY COFFEE CUPS INTAKE FOR STAFF

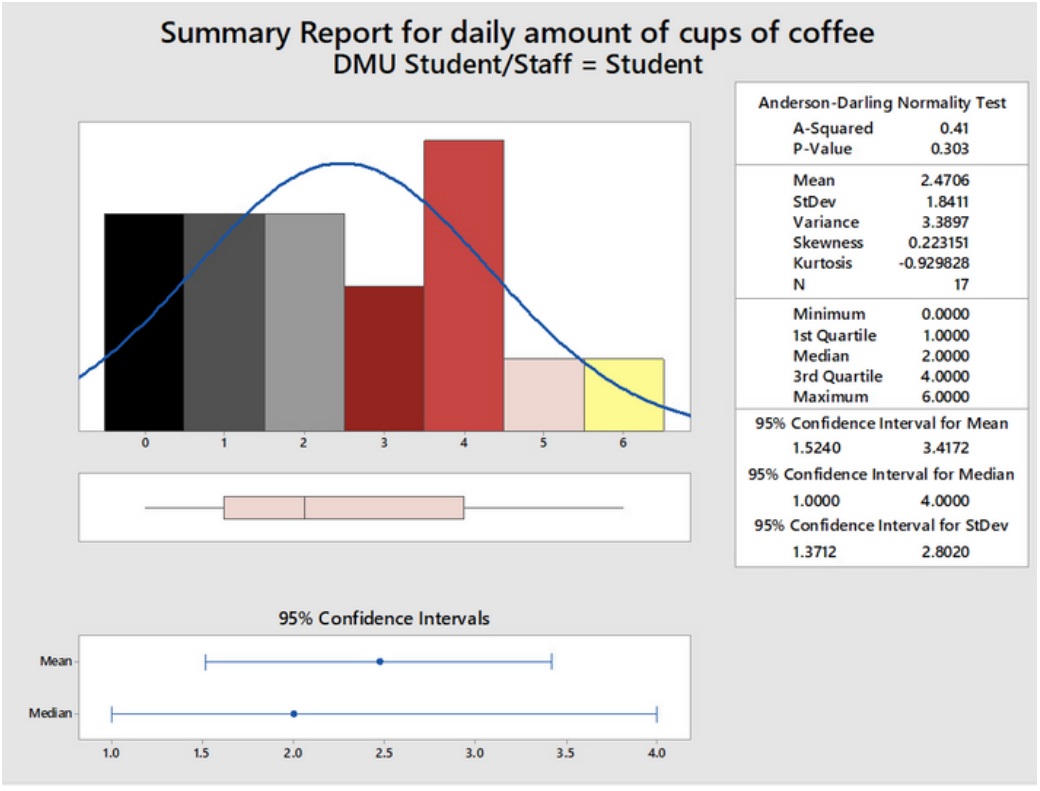

FIGURE 4.2 SUMMARY REPORT FOR DAILY COFFEE CUPS INTAKE FOR STUDENTS

AVERAGE DAILY CUP CONSUMPTION

One-Sample T: staff cup/day, student cup/day

Descriptive Statistics

Sample	N	Mean	StDev	SE Mean	95% CI for μ
staff cup/day	15	4.467	1.685	0.435	(3.534, 5.400)
student cup/day	17	2.588	1.502	0.364	(1.816, 3.361)

μ: mean of staff cup/day, student cup/day

Test

Null hypothesis	H_0: μ = 3
Alternative hypothesis	H_1: μ ≠ 3

Sample	T-Value	P-Value
staff cup/day	3.37	0.005
student cup/day	-1.13	0.275

FIGURE 4.3 ONE-SAMPLE HYPOTHESIS TESTING FOR STAFF AND STUDENTS CUPS/DAY

Staff

For the staff group, the t-value of 3.37 and p-value of 0.005 suggest that there is a statistically significant difference between the average number of cups consumed by staff and the hypothesized value of 3 cups per day. Specifically, the staff group consumes significantly more coffee than the hypothesized value.

Students

For the student group, the t-value of -1.13 and p-value of 0.275 suggest that there is not a statistically significant difference between the average number of cups consumed by students and the hypothesized value of 3 cups per day. Specifically, the data do not provide sufficient evidence to conclude that the student group consumes a different amount of coffee on average than the hypothesized value.

Overall, these results suggest that staff members consume significantly more coffee than the hypothesized value of 3 cups per day, while there is not enough evidence to conclude that the student group consumes a different amount of coffee on average than the hypothesized value. This disproves the initial hypothesis (refer **Appendix A**)

AMOUNT OF COFFEE VS. SATISFACTION IN DRINKING HABITS

Understanding the relationship between coffee consumption and overall satisfaction with coffee drinking habits is an essential aspect of coffee consumption research. This section will focus relation between amount of coffee and noncoffee drink per day with satisfaction in drinking habits.

Coffee

The **Figure 5.1 Fitted line plot for amount of coffee cups per day vs. satisfaction with drinking habits** provides information about the relationship between those two variables. The S value of 1.45731 representing the standard error of the estimate indicates that the data points are about 1.46 unit away from the fitted line.

The R-squared value of 6.3% indicated that only 6.3% of the variation in the overall satisfaction with coffee drinking habits can be explained by the amount of coffee consumed per day.

The adjusted R-squared value of 3.1% indicated that the addition of another variable to the model did not significantly improve the model.

In conclusion, the fitted line plot indicates that there is a weak and limited relationship between the amount of coffee consumed per day and overall satisfaction with coffee drinking habits. Only a small proportion of the variation in overall satisfaction can be explained by the amount of coffee consumed per day, and the addition of other variables did not significantly improve the model's fit.

AMOUNT OF COFFEE VS. SATISFACTION IN DRINKING HABITS

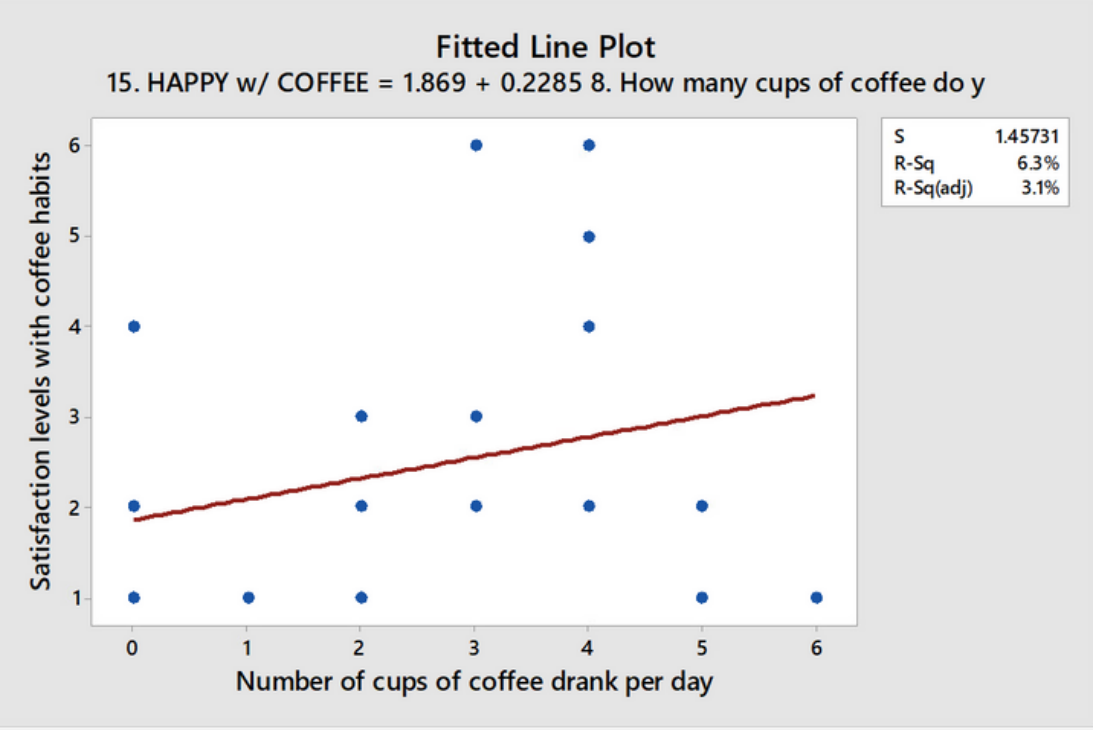

FIGURE 5.1 FITTED LINE PLOT FOR AMOUNT OF COFFEE CUPS PER DAY VS. SATISFACTION WITH DRINKING HABITS

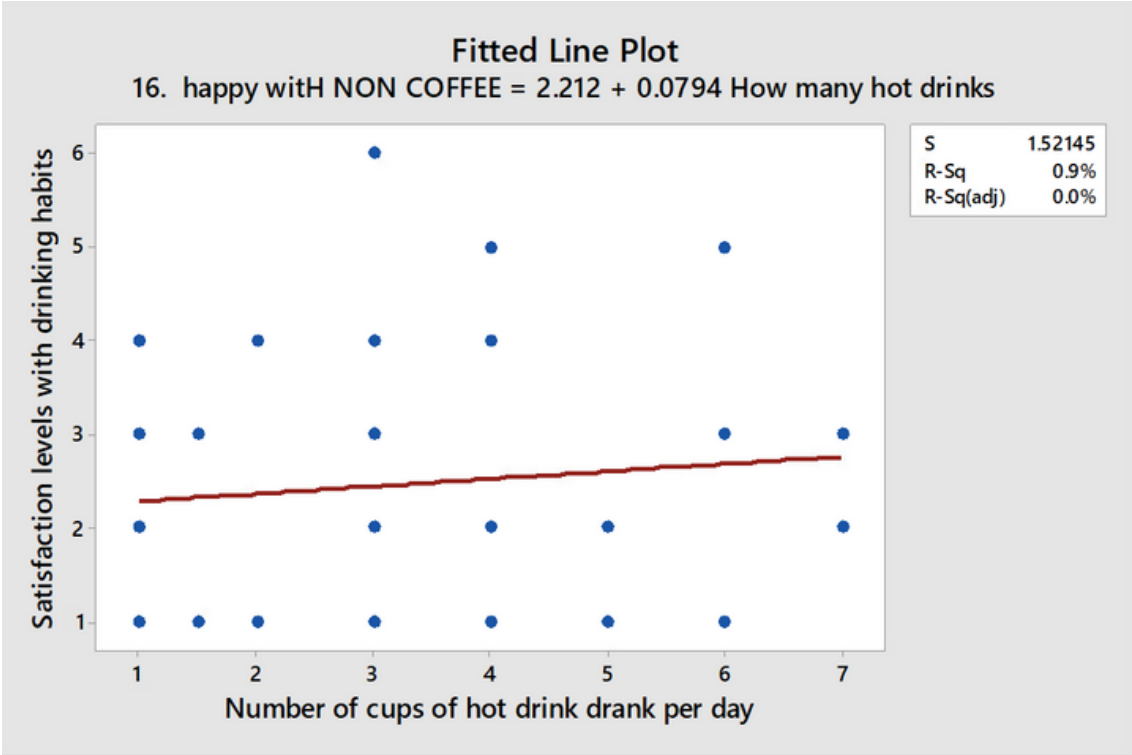

FIGURE 5.2 FITTED LINE PLOT FOR AMOUNT OF NON-COFFEE CUPS PER DAY VS. SATISFACTION WITH DRINKING HABITS

AMOUNT OF COFFEE VS. SATISFACTION IN DRINKING HABITS

Other drinks

The **Figure 5.2 Fitted line plot for amount of non-coffee cups per day vs. satisfaction with drinking habits** present similarly to previous analysis, relationship between two variables. In case of non-coffee drinks S value of 1.52145 indicates that the data points are approximately 1.52 units away from the fitted line on average.
The R-squared value of 0.9% indicates that only 0.9% of the variation in the overall satisfaction with coffee habits can be explained by the amount of non-coffee consumed per day.
The adjusted R-squared value of 0% indicates that the addition of other variables to the model did not significantly improve the fit of it.
In summary, there is a very weak and limited relationship between the amount of non-coffee consumed per day and overall satisfaction in drinking habits. Moreover, additions of other variables did not improve the models fit.

The plots for both coffee and non-coffee drinks suggest no relation between studied factor, therefore number of cups consumed per day have no effect on satisfaction in drinking habits. It disproves the initial hypothesis (refer to **Appendix A**)

REASONS FOR PURCHASE – STUDENTS VS. STAFF

In the survey, participants were ask what factors are influencing their decision on coffee purchase. They have been given 4 main factors: price, convenience, quality, brand. Open bar option was also provided. The results of this question are presented in **Figure 6.1: Bar chart for purchase influence – overall** and **Figure 6.2: Bar chart for purchase influence – student and staff.**

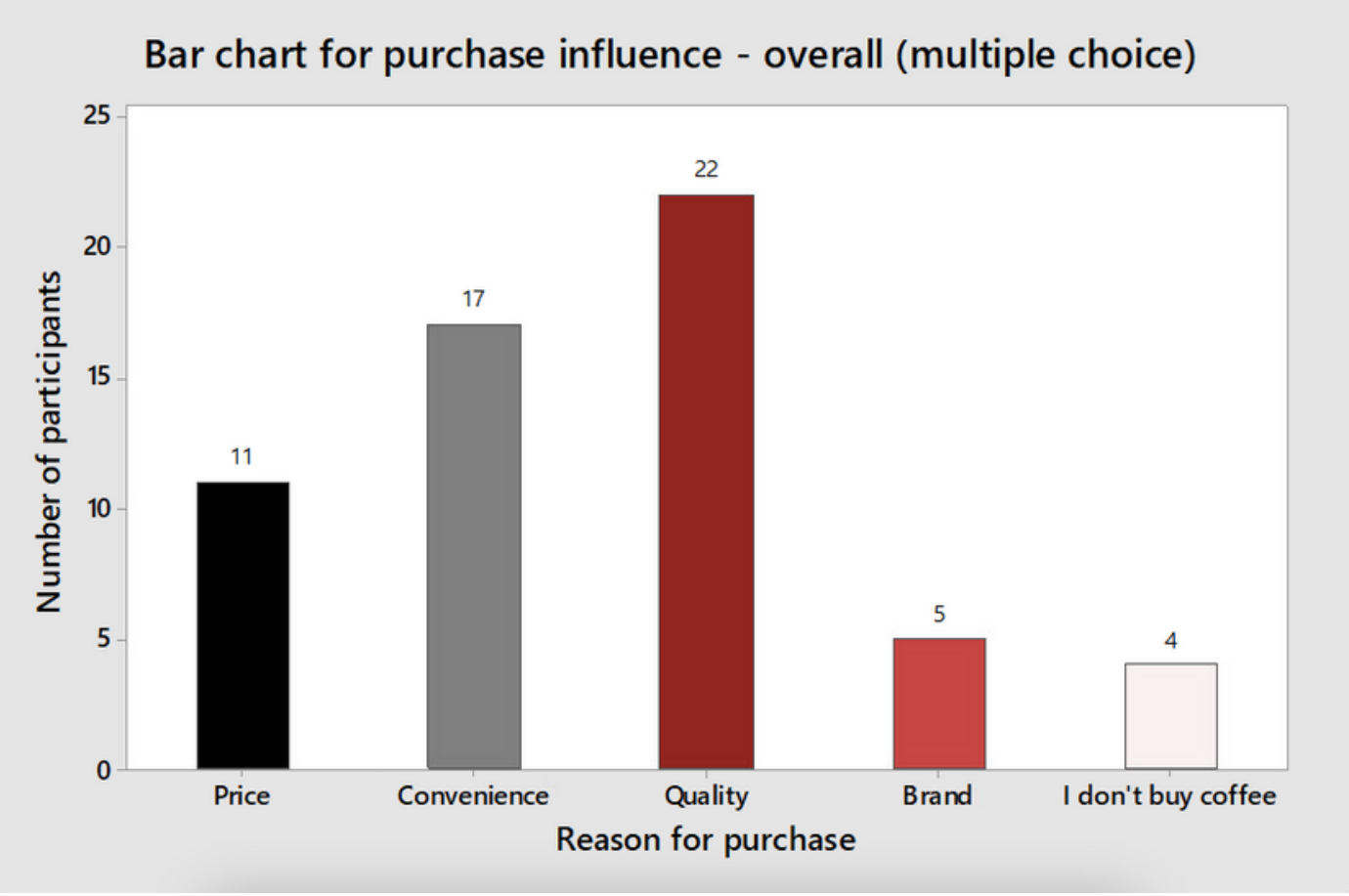

FIGURE 6.1: BAR CHART FOR PURCHASE INFLUENCE – OVERALL

REASONS FOR PURCHASE – STUDENTS VS. STAFF

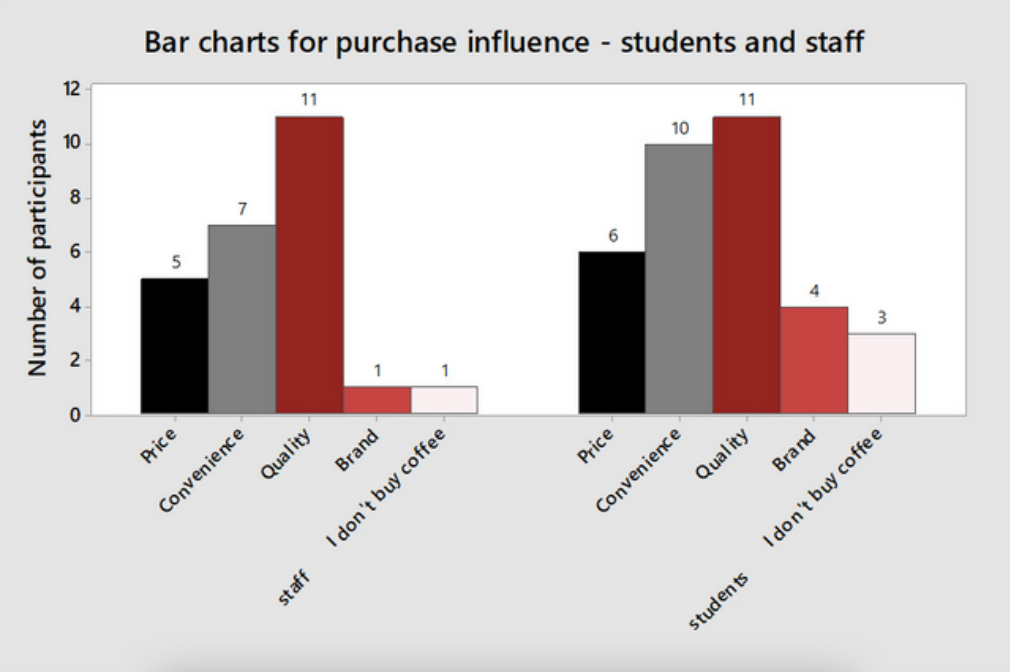

FIGURE 6.2: BAR CHART FOR PURCHASE INFLUENCE – STUDENT AND STAFF

On **Figure 6.2** the left-hand side graph represents data obtained from staff participants, the right-hand side the students' choices. The brand and I do not drink coffee were given once among staff, in contrast to students who selected brand 4 times and I do not drink coffee 3 times. It concludes that 4 participants, 1 among staff and 3 among student do not purchase coffee, therefore suggest that those participants do not drink coffee at all. The brand seems to be more influential factor students than for staff. Price was selected by 5 staff member and 6 students, which indicates similar preference among both groups. Similarly, to most selected factor Quality (11 inputs from both groups) it suggests that quality is most important factor for both student and staff. On contrary, convenience was selected only 7 times by staff and 10 times by students.

REASONS FOR PURCHASE - STUDENTS VS. STAFF

It concludes that for both student and staff quality is most important factor when purchasing coffee. Students seem to be more influenced by brand and convenience in comparison to staff. The reasoning for it might be related to age difference between those two groups as well as the budget. From **Figure 6.3: Two sample hypothesis test for expendable cash among staff and student** it shows that on average staff members have £340 more expendable cash than students.

Two-Sample T-Test and CI: avarage expendable cash, Are ... nt or staff

Method

μ_1: mean of avarage expendable cash when Are you DMU student or staff = Staff

μ_2: mean of avarage expendable cash when Are you DMU student or staff = Student

Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics: avarage expendable cash

Are you DMU student or staff	N	Mean	StDev	SE Mean
Staff	15	1017	563	145
Student	17	677	482	117

Estimation for Difference

Difference	95% CI for Difference
340	(-43, 723)

Test

Null hypothesis	H_0: $\mu_1 - \mu_2 = 0$
Alternative hypothesis	H_1: $\mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
1.82	27	0.079

FIGURE 6.3: TWO SAMPLE HYPOTHESIS TEST FOR EXPENDABLE CASH AMONG STAFF AND STUDENT

AVERAGE AGE OF STARTING DRINKING COFFEE

The last initial hypothesis states that average starting age among non-natives is lower than among natives. The aim of this section is to analyse the obtained data and test the stated hypothesis.

Figure's 7.1 Two sample hypothesis test for average starting drinking age among natives and non-natives given data is related to the age at which non-native English speakers and native English speakers started drinking coffee. The summary statistics for both groups are:

- Non-natives: sample size (N) = 15, mean = 15.10, standard deviation (StDev) = 4.96, standard error of the mean (SE Mean) = 1.3.
- Natives: sample size (N) = 17, mean = 15.35, standard deviation (StDev) = 5.05, standard error of the mean (SE Mean) = 1.2.

The difference in means between the two groups is -0.25 with 95% confidence intervals (-3.87, 3.37). This data suggests that there is no significant difference between the starting age among all participants. The confidence interval includes zero, which indicates that the difference in means is not statistically significant.

Moreover, both groups have similar standard deviations which suggest that the spread of data points is similar for both natives and non-natives. Lastly, the standard error of the mean is relatively small for both groups, indicating that the sample means are likely to be close to the true population means.

AVERAGE AGE OF STARTING DRINKING COFFEE

Two-Sample T-Test and CI: avarage qs 14, 5. Are you English native?

Method

μ_1: mean of avarage qs 14 when 5. Are you English native? = No

μ_2: mean of avarage qs 14 when 5. Are you English native? = Yes

Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics: avarage qs 14

5. Are you English native?	N	Mean	StDev	SE Mean
No	15	15.10	4.96	1.3
Yes	17	15.35	5.05	1.2

Estimation for Difference

Difference	95% CI for Difference
-0.25	(-3.87, 3.37)

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
-0.14	29	0.887

FIGURE 7.1 TWO SAMPLE HYPOTHESIS TEST FOR AVERAGE STARTING DRINKING AGE AMONG NATIVES AND NON-NATIVES

Overall, the data suggests that there is no significant difference in the age at which non-native English speakers and native English speakers start drinking coffee. This disproved initial hypothesis (refer to **Appendix A**).

MONTHLY COFFEE SPENDINGS - STUDENTS VS. STAFF

Another factor which has been studied in this survey is average monthly coffee spendings among DMU students and staff. This section will analyse hypothesis testing for two sample to find if there is a significant different between spending among those two groups.

The two-sample hypothesis testing in this scenario is testing whether there is a significant difference between the average monthly coffee spending among staff and students. (**Figure 8.1 two sample hypothesis testing for average monthly coffee spend for students and staff** and **Figure 8.2 Boxplot for hypothesis testing for average monthly coffee spend for students and staff**)

Two-Sample T-Test and CI

Method

μ_1: mean of average 13 when 1. Are you DMU student or staff = Staff

μ_2: mean of average 13 when 1. Are you DMU student or staff = Student

Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics:

1. Are you DMU student or staff	N	Mean	StDev	SE Mean
Staff	15	23.7	16.6	4.3
Student	17	24.4	18.8	4.6

Estimation for Difference

Difference	95% CI for Difference
-0.62	(-13.44, 12.20)

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
-0.10	29	0.922

FIGURE 8.1 TWO SAMPLE HYPOTHESIS TESTING FOR AVERAGE MONTHLY COFFEE SPEND FOR STUDENTS AND STAFF

MONTHLY COFFEE SPENDINGS - STUDENTS VS. STAFF

Null Hypothesis: There is no significant difference in the average monthly coffee spending between staff and students.
Alternative Hypothesis: There is a significant difference in the average monthly coffee spending between staff and students.

Since the p-value (0.922) is much greater than the significance level (0.05), we fail to reject the null hypothesis. Therefore, we can conclude that there is no significant difference in the average monthly coffee spending between staff and students.

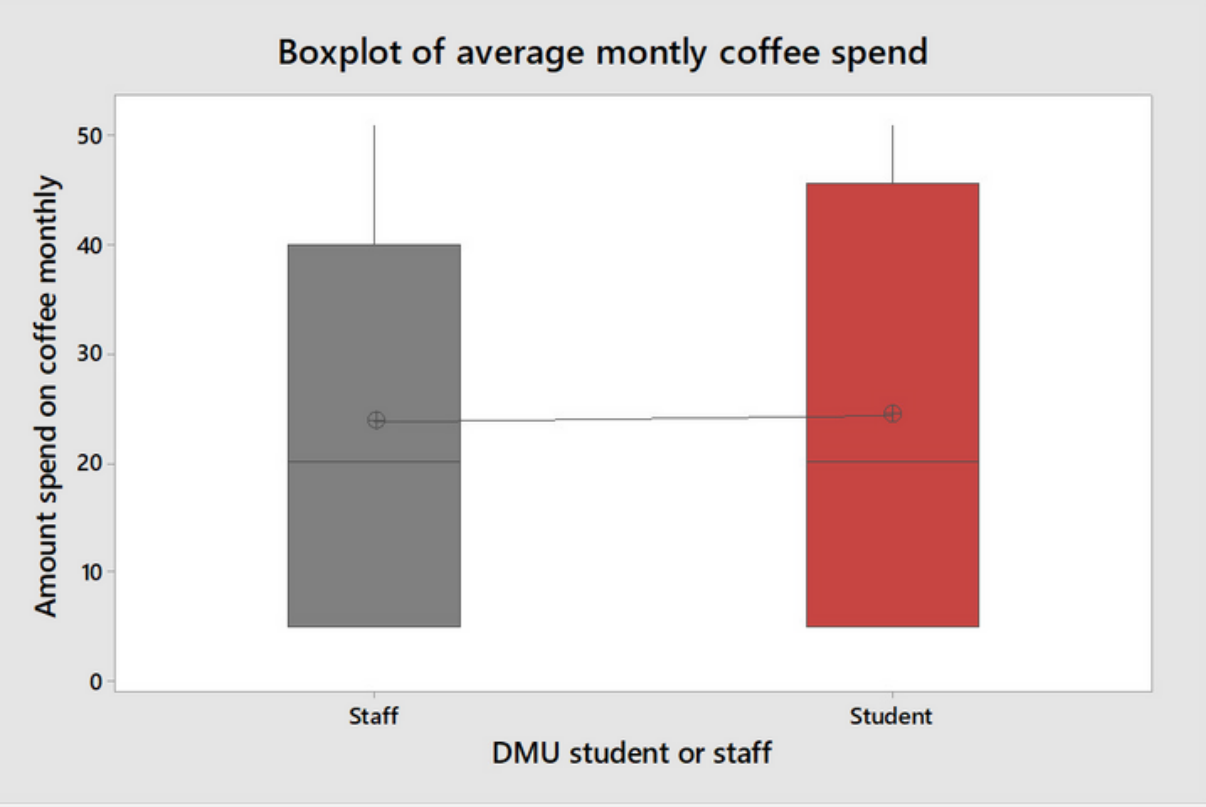

FIGURE 8.2 BOXPLOT FOR HYPOTHESIS TESTING FOR AVERAGE MONTHLY COFFEE SPEND FOR STUDENTS AND STAFF

ACQUISITION METHODS - STUDENTS VS STAFF

Last aspect to be analysed in this paper is the preference of the way of obtaining the coffee among students and staff. Unfortunately, due to categorical data obtained in this question the proper analysis cannot be applied. For future solution of this problem refer to **section 13: Evaluation and recommendations.**

This section analyse scenario whether there is a significant difference in the average age among participant based on their way of obtaining their drinks. The reasoning behind this approach was the assumption that average age among staff would be higher than among students (which has been confirmed in **Figure 9.2 hypothesis testing for average age among student and staff** with the difference of 9.27 and 95% confidence intervals (0.00, 18.53))

Figure 9.1 hypothesis testing for way obtaining the drink vs. average age indicated that p-value (0.660) is greater than the significance level (0.05) therefore we fail to reject the null hypothesis.

In conclusion, there is no significant difference in the average age among participants based on their way of obtaining their drinks.

ACQUISITION METHODS - STUDENTS VS STAFF

Two-Sample T-Test and CI: avarage age, 11. How do you ... cally obtain

Method

μ_1: mean of avarage age when 11. How do you typically obtain = Made by barista

μ_2: mean of avarage age when 11. How do you typically obtain = Making it yourself

Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics: avarage age

11. How do you typically obtain	N	Mean	StDev	SE Mean
Made by barista	15	32.5	13.1	3.4
Making it yourself	17	30.4	13.7	3.3

Estimation for Difference

Difference	95% CI for Difference
2.11	(-7.60, 11.83)

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
0.44	29	0.660

FIGURE 9.1 HYPOTHESIS TESTING FOR WAY OBTAINING THE DRINK VS. AVERAGE AGE

ACQUISITION METHODS - STUDENTS VS STAFF

Two-Sample T-Test and CI: avarage age, Are you DMU student or staff

Method

μ_1: mean of avarage age when Are you DMU student or staff = Staff

μ_2: mean of avarage age when Are you DMU student or staff = Student

Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics: avarage age

Are you DMU student or staff	N	Mean	StDev	SE Mean
Staff	15	36.3	13.6	3.5
Student	17	27.0	11.7	2.8

Estimation for Difference

Difference	95% CI for Difference
9.27	(0.00, 18.53)

Test

Null hypothesis	H_0: $\mu_1 - \mu_2 = 0$
Alternative hypothesis	H_1: $\mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
2.05	27	0.050

FIGURE 9.2 HYPOTHESIS TESTING FOR AVERAGE AGE AMONG STUDENT AND STAFF

EVALUATION AND RECOMMENDATIONS

A crucial part of conducting research is critical evaluation upon done work. The purpose of it is to prevent future mistakes, find more effective way to obtain data in next research and potentially give a lesson for reader. This section will focus on evaluation and future recommendation of the paper.

The pilot survey

As mentioned in **section 4: Pilot survey** upon gaining more experience with the software used to analyse the data, the analysis method with obtained information were not fully possible. Due to lack of experience the initial approach and hypothesis had to be confirmed by rewriting the data with respect of category using Excel. It caused additional work for researcher, and it could be avoided with though through questions and desire data to be obtained.

Overall, pilot survey has been successful as it allowed to verify the inclusivity for participants. Moreover, it ensures clarity of all questions. However, the type of data obtained in the survey had to be adjusted to planned analysis.

Type of data

One of the main issues of this paper is type of data obtained in final survey. Initially the planned data analysis was not fully possible with categorical data in few questions. The issue could have been resolve by rephrasing them to gather numerical data. For example, instead of asking participant to name their favourite drink the researcher could ask to rate each drink. Additional description of each drink could prevent from misunderstandings on both and ensure clarity of the question with opportunity for obtaining data about preferable proportions (e.g., linear rating 1- a drop of milk; 5-full cup of milk) Lastly, the question 15 and 16 had confusing rating scale which might have cause wrong results if any relation.

EVALUATION AND RECOMMENDATIONS

Focus over generality

The importance of overviewing research is significant. However, especially on beginners' level it would be advisable to narrow the area of study to more specific one. This paper could benefit from changing the research topic to Favourite coffee-based drink among DMU students and staff which would eliminate non-coffee based drinks and ask more specifically which could be produce a valuable numerical data such as rating of named drink and giving ideal ratios for their drinks.

In the future research the desire data obtained by researcher had to be stated before constructing the survey. Additionally, planned analysis need to be tested during pilot survey, even when sample size is small. It could prevent from previously mention issues, however due to researcher being novice the overall quality of the paper is satisfying with room for improvements.

CONCLUSION

In closing, the study provides valuable insights into coffee habits among DMU students and staff. Based on results most preferable drink is latte, average coffee consumption is higher among staff and 75% of participants starts their day with caffeinated drink. To obtain those results hypothesis analysis for both one and two sample were run, as well as plotting bar and pie chart to understand data clearly. Additionally, graphical summary was used to study average daily coffee cup consumption and fitted plotted line attempt to study relation between amount of cups drink daily and satisfaction in coffee habits – which showed no relation. From three stated hypothesis in Survey Plan (Appendix A) all got disproven.

Due to overload of categorical data many manual inputs and averages had to inserted. For the future, the evaluation has been done with conclusion of more careful preparation for research and deeper analysis of pilot survey. Overall, the paper gave understanding of coffee habits among DMU students and staff and could offer potential expand upon chosen aspect by future researchers.

APPENDICES

Appendix A
Survey Plan

Title:
Coffee habits among DMU students and staff

Aims of survey:
The purpose of this survey is to analyse the differences in coffee habits among DMU student and staff and how external factor such as income, nationality and age are influencing it.

Location:
DMU campus

Population details:
Subject: DMU student and staff
Target population: DMU student and staff who drink hot drinks
Study population: 32
Sampling unit: 30-40

Type of sample design to be used: online questionnaire (using Google forms)

Details of sampling frame:
online questionnaire conducted using closed questions (multiple choice questions, linear scale) distributed via social media and QR code

Details of how subjects are to be selected:
To achieve the impartial results, survey must be distributed evenly between students and staff. Moreover, the answers between female, male and non-binary should be given out proportionately. In order to reach those results the questionnaire responses should be monitored and if disproportions appear – reach to desired study subgroup.

Sample size:
10% of final answers (3-4 responses) 50% from those should come from students and remaining 50% from staff to achieve fair sample results.

Data collection method(s) to be employed:
To collect the objective survey results online questionnaire was distributed via social media online and shared with QR code during face-to-face contact. There was no instruction needed for this survey as questions were self-explanatory.

Hypothesis to confirm:

- Average starting age is higher amongst natives.
- The different between coffee consumption between staff and student would be insignificant.
- The satisfaction of current coffee habits among coffee drinkers would be lower than those who does not.

APPENDICES

Appendix B
Pilot survey

Total number of subjects:
In pilot survey participate 4 people from which:
50% are DMU students and 50% are DMU staff
50% are at age of 21 to 24, 25% at age of 40-55 and 25% at age of 55+
75% are male and 25% are female
75% is non-English native and 25% is English native
50% has 0 to 500 pounds monthly of expendable cash, 25% has 1001-1500 and 25% 1500+

Characteristic of the subjects:
4 responses were obtained from 2 staff representative and 2 students which gave ideal distribution in pilot survey. However, 75% of responders were male and 25% were female which may disturb the fairness of results in the future if not monitored. Most responders are between age of 21 to 24 (50%). The remaining 50% is from one person at age of 55+ and one from age 40 to 55. Among those 4 responders only one is English native. Lastly, amid 4 responders half of them have 0-500 pounds of expendable cash monthly, 1 responder has between 1001 and 1500 pounds and remaining responder has 1500+ pounds monthly.

Time scale for conducting the pilot survey:
10 days

Location of pilot survey:
DMU campus and online distribution

Details of data to be collected and data analyst to be performed:
The survey will collect following data:

1. Demographic information
    - Age
    - Gender
    - Student or staff
    - Expendable income
    - English native or not
2. Individual preferences
    - Drink(s) of choice
    - Decaf/non-decaf preference
    - Barista/homemade preference
    - Spendable budget on coffee drinks and beans
    - How many drinks they consume per day
3. Behavioural data
    - Factors influencing purchase
    - Satisfaction from current coffee habits
    - Starting age of drinking coffee

APPENDICES

Data Analysis to be performed:

1. Demographic information:
    - Descriptive statistics: Frequencies and percentages for each demographic variable (age, gender, student/staff status, expendable income, English native or not)
    - Bivariate analysis: Association between demographic variables and individual preferences, such as expenditure on coffee drinks and beans
    - Cluster analysis: Identification of subgroups with similar demographic and preference characteristics
2. Individual preferences:
    - Descriptive statistics: Frequencies and percentages for drink(s) of choice, decaf/non-decaf preference, barista/homemade preference, spendable budget on coffee drinks and beans, and how many drinks they consume per day
    - Bivariate analysis: Association between demographic variables and individual preferences, such as expenditure on coffee drinks and beans
    - Cluster analysis: Identification of subgroups with similar demographic and preference characteristics
    - Regression analysis: Identification of the predictors of expenditure on coffee drinks and beans
3. Behavioural data:
    - Descriptive statistics: Frequencies and percentages for factors influencing purchase, satisfaction from current coffee habits, and starting age of drinking coffee
    - Bivariate analysis: Association between demographic variables and behavioural data, such as factors influencing purchase
    - Regression analysis: Identification of the predictors of satisfaction from current coffee habits
    - Cluster analysis: Identification of subgroups with similar behavioural patterns

The results of these data analyses can provide insights into the demographic and preference characteristics of coffee drinkers, as well as their purchasing and consumption behaviours. This information can be used to inform marketing and business strategies, such as product development, pricing, and customer segmentation.

APPENDICES

Coffee habits among DMU students and staff

Thank you for agreeing to take part in this questionnaire designed to discover coffee habits among DMU student and staff. The data collected will be used in a research report for IMAT1226_2223 Statistics I module. The questionnaire will take approximately 2-3 minutes to complete and all information is anonymous. If you have any questions, please consult the researcher: p2723877@my365.dmu.ac.uk

* Indicates required question

1. Select yes if you agree to participate in questionnaire (which mean you give consent for all information given to be used for research purposes) *

Tick all that apply.

- [ ] Yes

2. 1. Are you DMU student or staff? *

Mark only one oval.

- ◯ Student
- ◯ Staff

3. 2. How old are you? *

Mark only one oval.

- ◯ <20
- ◯ 21-24
- ◯ 25-30
- ◯ 31-39
- ◯ 40-55
- ◯ 55+

4. 3. What gender do you identify as? *

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Non-binary
- ◯ Prefer not to disclose

5. 4. How much expendable cash you have each month? *

Mark only one oval.

- ◯ £0-500
- ◯ £501-1000
- ◯ £1001-1500
- ◯ £1500+
- ◯ Prefer not to disclose

6. 5. Are you English native? *

Mark only one oval.

- ◯ Yes
- ◯ No

7. 6. Do you drink hot drinks? *

Mark only one oval.

- ◯ Yes
- ◯ No

If you answer *"no"* to previous question please do not answer the remaining one - just press submit. Thank you for participating in this survey.

8. 7. How many hot drinks do you drink per day? (insert in scale 1-100)

9. 8. How many cups of coffee do you drink per day? (insert in scale 1-100)

10. 9. What is your drink of choice? Choose as many as applicable

Tick all that apply.

- [ ] Espresso
- [ ] Macchiato
- [ ] Americano
- [ ] Latte
- [ ] Cappuccino
- [ ] Mocha
- [ ] Flat White
- [ ] Hot Chocolate
- [ ] Tea

APPENDIX C:QUESTIONNAIRE

APPENDICES

11. 10. For the first drink of the day: do you tend to choose caffeinated or decaf drink?

Mark only one oval.

- ◯ Caffeinated
- ◯ Decaf

12. 11. How do you typically obtain your hot drinks?

Mark only one oval.

- ◯ Making it yourself
- ◯ Made by barista

13. 12. What factors influence your coffee purchase decision? (Check all that apply) *

Tick all that apply.

- ☐ Price
- ☐ Convenience
- ☐ Quality
- ☐ Brand
- ☐ Other: _____

14. 13. How much monthly are you spending on hot drinks? (Both beans/tea bags and drinks away)

Mark only one oval.

- ◯ £0-10
- ◯ £11-30
- ◯ £31-50
- ◯ £50+

15. 14. At what age you started drinking coffee?

Mark only one oval.

- ◯ <14
- ◯ 14-16
- ◯ 17-19
- ◯ 20-25
- ◯ 25+
- ◯ I do not drink coffee

16. 15. Are you happy with your current coffee drinking habits?

Mark only one oval.

	1	2	3	4	5	6	
Very	◯	◯	◯	◯	◯	◯	Very unhappy

17. 16. Are you happy with your current drinking habits with other hot drinks besides coffee?

Mark only one oval.

	1	2	3	4	5	6	
Very	◯	◯	◯	◯	◯	◯	Very unhappy

REFERENCE LIST

British Coffee Association (2023) *Coffee consumption* (2023) Available at: https://britishcoffeeassociation.org/coffee-consumption/ (Accessed: April 20, 2023).

Harvard School of Public Health (2023) *Caffeine* Available at: https://www.hsph.harvard.edu/nutritionsource/caffeine/ (Accessed: April 20, 2023).