Students Alcohol Consumption

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Introduction

Alcohol Use Disorder

- 13% of college students meet the criteria for past-year AUD.
- Fear of missing out, social pressure, stress, mental health, etc.
- Our focus: SMART question

SMART question:

How does a students' time management distribution—considering factors such as study time, extracurricular activities, free time, and time going out—relate to Alcohol Consumption?

Data Set Source

- Our data set came from Kaggle.
  - **Source: https://www.kaggle.com/datasets/uciml/student-alcohol-consumption/**
- The data was collected from a survey from University of California Irvine Portuguese language and Math students.
- The data has 649 observations
- It was consisted of 33 variables, but we only chose 6 out of 33 variables based on our SMART question in time management.

Variables that we use

Weekend Alcohol Consumption (Walc)	Y-target variable; weekend alcohol consumption (ordinal: from 1 - very low to 5 - very high)
Workday Alcohol Consumption (Dalc)	Y-target variable; workday alcohol consumption (ordinal: from 1 - very low to 5 - very high)
Study Time	weekly study time (ordinal: 1 - <2 hours, 2 - 2 to 5 hours, 3 - 5 to 10 hours, or 4 - >10 hours)
Free Time	free time after school (ordinal: from 1 - very low to 5 - very high)
Goout	Student's frequency of going out with friends(ordinal: from 1 - very low to 5 - very high)
Activities	activities - extracurricular activities (binary: yes or no)

Graphs and Plots

Study Time

Chi Squared Test of Independence

H_0: Study Time and Weekend/workday alcohol consumption are independent

H_a: Two variables are not independent

Weekend Alcohol Consumption

data: st contable

X-squared = 53, df = 12, **p-value = 4e-07**

Workday Alcohol Consumption

data: st contable

X-squared = 37, df = 12, **p-value = 2e-04**

Spearman Correlation Test

H_0: There are no correlations between Study Time and Weekend/workday alcohol consumption.

H_a: There are correlations between Study Time and Weekend/workday alcohol consumption.

Weekend Alcohol Consumption

data: df$Walc and df$studytime

S = 6e+07, **p-value = 1e-08**

sample estimates:

rho

-0.222

Workday Alcohol Consumption

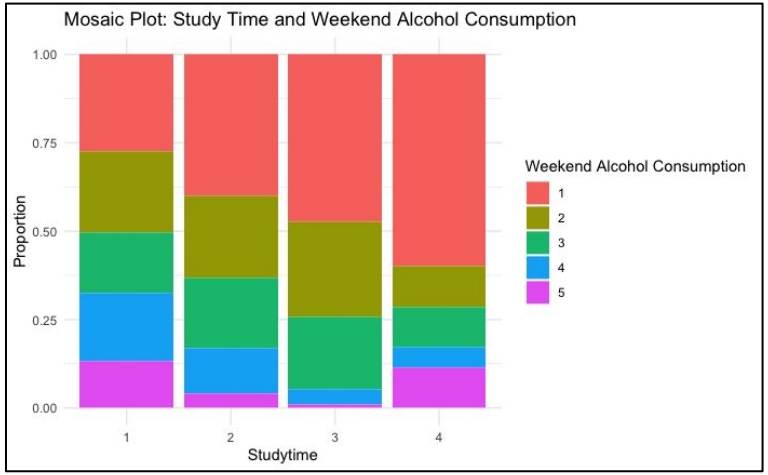
data: df$Dalc and df$studytime

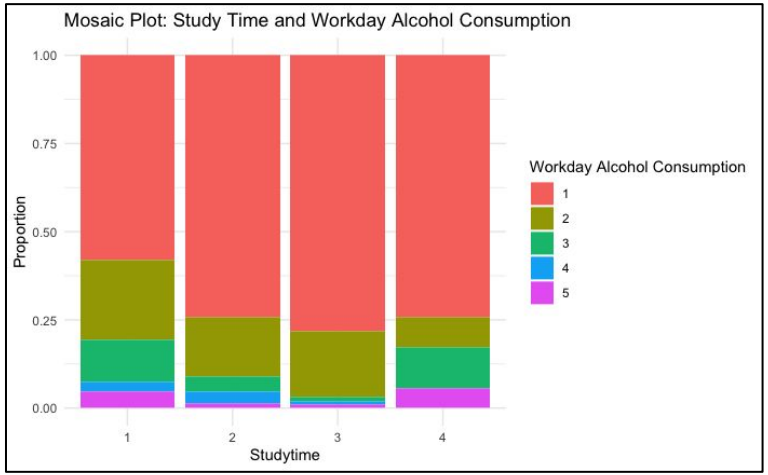
S = 5e+07, p-value = 1e-05

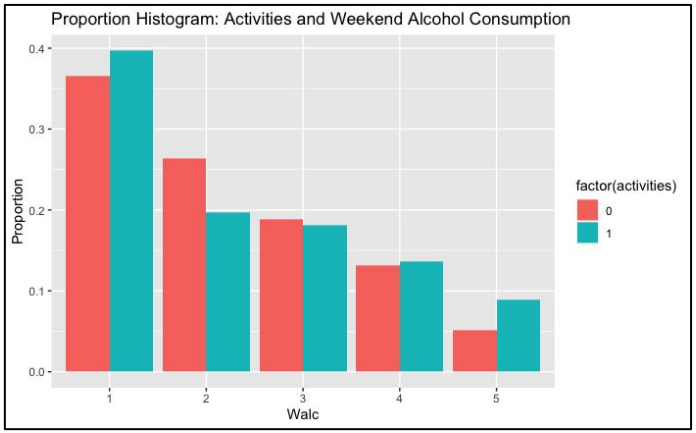
sample estimates:

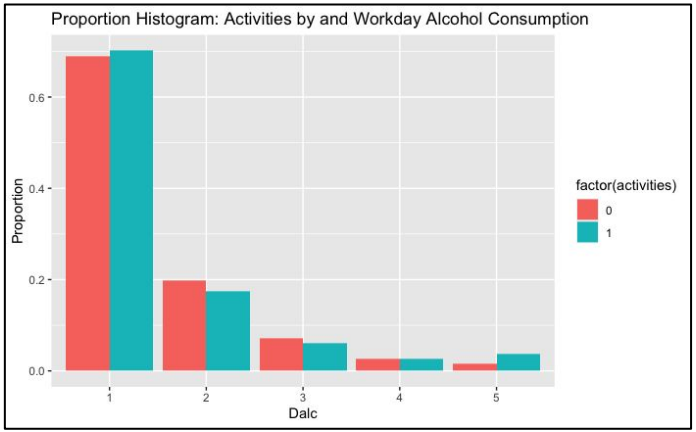
rho

-0.171









Extracurricular Activities

Chi Squared Test of Independence

H_0: Extracurricular activities and Weekend/workday alcohol consumption are independent

H_a: Two variables are not independent

Weekend Alcohol Consumption

data: a-contable

X-squared = 7, df = 4, **p-value = 0.1**

Workday Alcohol Consumption

data: a contable

X-squared = 4, df = 4, **p-value = 0.4**

Spearman Correlation Test

H_0: There are no correlations between Extracurricular activities and Weekend/workday alcohol consumption.

H_a: There are correlations between Extracurricular Activities and Weekend/workday alcohol consumption.

Weekend Alcohol Consumption

data: df$Walc and df$activities

S = 4e+07, **p-value = 0.7**

sample estimates:

rho

0.015

Workday Alcohol Consumption

S = 5e+07, **p-value = 0.9**

sample estimates:

rho

-0.00607

Going Out

Chi Squared Test of Independence

H_0: Going out and Weekend/workday alcohol consumption are independent

H_a: Two variables are not independent

Weekend Alcohol Consumption

data: go contable

X-squared = 138, df = 16, **p-value <2e-16**

Workday Alcohol Consumption

data: st contable

X-squared = 37, df = 12, **p-value = 2e-04**

Spearman Correlation Test

H_0: There are no correlations between Going out times and Weekend/workday alcohol consumption.

H_a: There are correlations between Going out times and Weekend/workday alcohol consumption.

Weekend Alcohol Consumption

data: df$Walc and df$goout

S = 3e+07, **p-value <2e-16**

sample estimates:

rho

0.372

Workday Alcohol Consumption

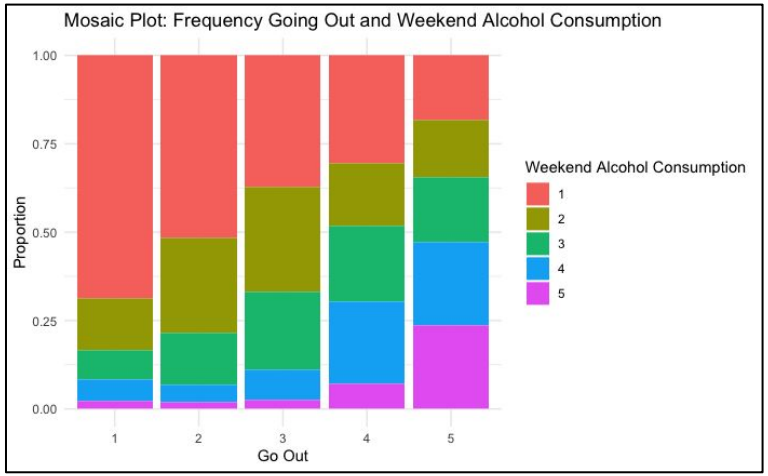
data: df$Dalc and df$freetime

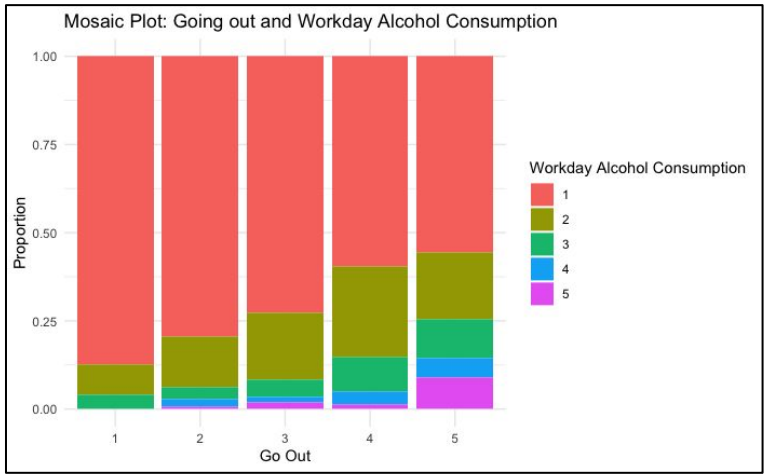
S = 4e+07, **p-value = 0.001**

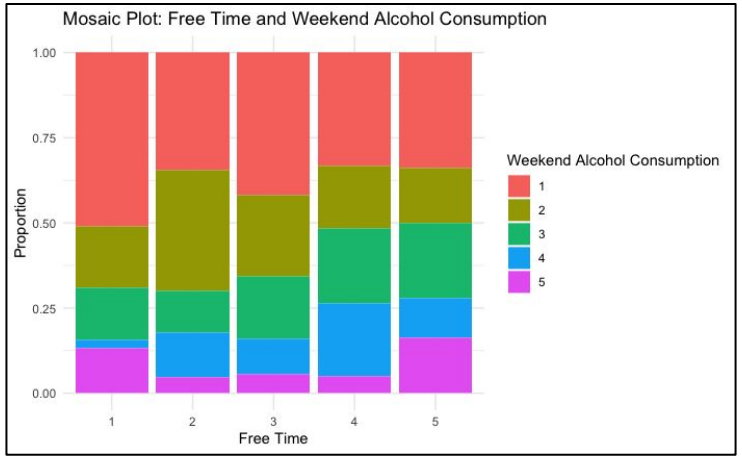
sample estimates:

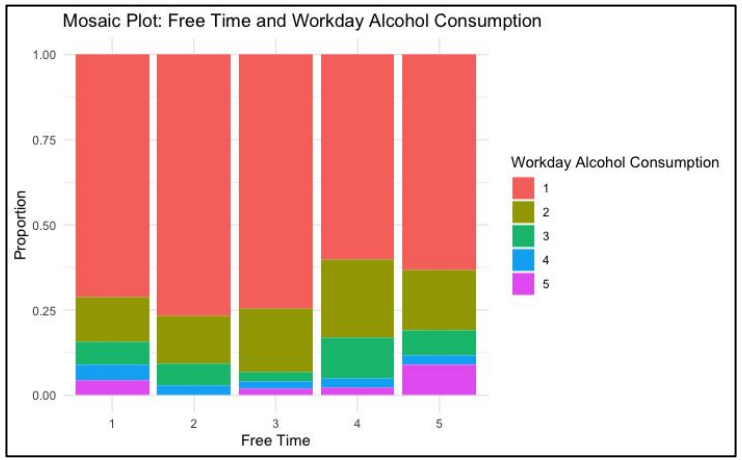
rho

0.127









Free Time

Chi Squared Independence Test

H_0: Free Time and Weekend/workday alcohol consumption are independent

H_a: Two variables are not independent

Weekend Alcohol Consumption

data: st contable

X-squared = 53, df = 12, **p-value = 4e-07**

Workday Alcohol Consumption

data: go contable

X-squared = 55, df = 16, **p-value = 4e-06**

Spearman Correlation Test

H_0: There are no correlations between free time and Weekend/workday alcohol consumption.

H_a: There are correlations between free time and Weekend/workday alcohol consumption.

Weekend Alcohol Consumption

data: df$Walc and df$freetime

S = 4e+07, **p-value = 0.002**

sample estimates:

rho

0.12

Weekend Alcohol Consumption

data: df$Dalc and df$goout

S = 3e+07, **p-value = 2e-09**

sample estimates:

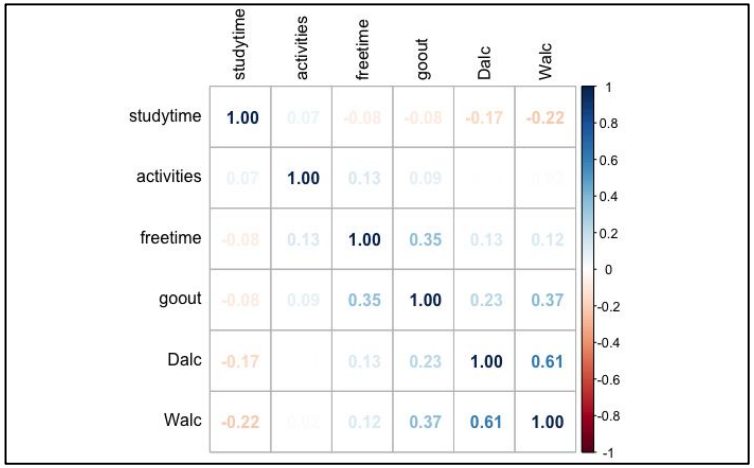
rho

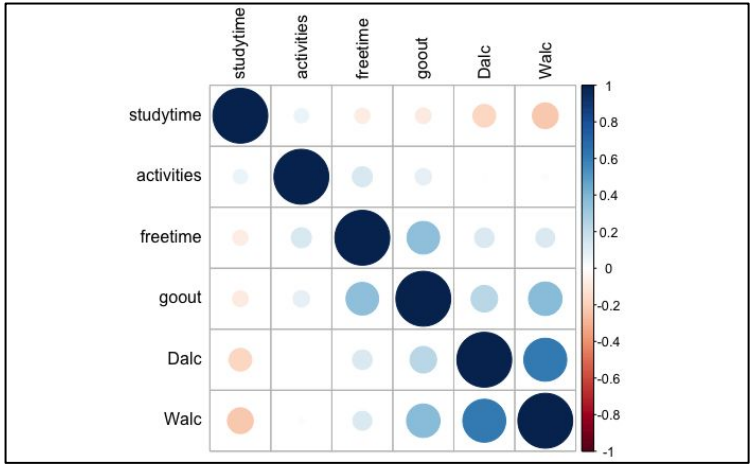
0.234

Spearman Correlation Plot

Student Alcohol Consumption Seems to Have:

- Negative Correlation with Study Time
- Positive Correlation with Free Time
- Positive Correlation with Goout
- Not Enough Evidence to say about Activities





Ordinal Logistic Regression

Weekend Alcohol Consumption
Ordinal Logistic Regression Model

```
Call:
polr(formula = factor(Walc) ~ factor(studytime) + factor(activities)
+
    factor(freetime) + factor(goout), data = df, Hess = TRUE)

Coefficients:
                       Value Std. Error t value
factor(studytime)2   -0.75357      0.169 -4.4594
factor(studytime)3   -1.00279      0.232 -4.3163
factor(studytime)4   -1.25206      0.371 -3.3725
factor(activities)1 -0.00292      0.148 -0.0197
factor(freetime)2    0.29149      0.345  0.8439
factor(freetime)3    0.06392      0.325  0.1966
factor(freetime)4    0.08749      0.339  0.2581
factor(freetime)5   -0.24167      0.400 -0.6038
factor(goout)2       0.77662      0.352  2.2037
factor(goout)3       1.31460      0.343  3.8273
factor(goout)4       1.96905      0.363  5.4215
factor(goout)5       2.88244      0.385  7.4946

Intercepts:
    Value  Std. Error t value
1|2  0.394  0.421      0.935
2|3  1.475  0.426      3.467
3|4  2.535  0.432      5.871
4|5  3.932  0.450      8.729

Residual Deviance: 1774.42
AIC: 1806.42
```

D-Somers Pseudo R^2 Value

```
             1         2         3         4         5
[1,] 0.6303456 0.9363668 0.7302576 0.6085275 0.6331591
```

Workday Alcohol Consumption
Ordinal Logistic Regression Model

```
Call:
polr(formula = factor(Dalc) ~ factor(studytime) + factor(activities)
+
    factor(freetime) + factor(goout), data = df, Hess = TRUE)

Coefficients:
                       Value Std. Error t value
factor(studytime)2   -0.78635      0.196 -4.0044
factor(studytime)3   -0.90820      0.291 -3.1183
factor(studytime)4   -0.55286      0.419 -1.3205
factor(activities)1 -0.05490      0.178 -0.3085
factor(freetime)2   -0.47166      0.415 -1.1367
factor(freetime)3   -0.38130      0.376 -1.0128
factor(freetime)4   -0.00798      0.386 -0.0207
factor(freetime)5   -0.33305      0.454 -0.7332
factor(goout)2       0.67916      0.488  1.3912
factor(goout)3       1.02931      0.474  2.1725
factor(goout)4       1.55033      0.482  3.2171
factor(goout)5       1.85304      0.490  3.7795

Intercepts:
    Value  Std. Error t value
1|2  1.204  0.540      2.230
2|3  2.480  0.548      4.528
3|4  3.410  0.562      6.067
4|5  4.147  0.587      7.063

Residual Deviance: 1152.12
AIC: 1184.12
```

D-Somers Pseudo R^2 Value

```
             1         2         3         4         5
[1,] 0.8031476 0.8258911 0.7939819 0.7890355 0.7879403
```

Prediction

What Level of Alcohol Consumption will a student have if they: participate in extracurricular activities (activities = 1), study less than 2 hours weekly (studytime = 1), go out with friends very often (goout = 5), and have a medium amount of free time? (freetime = 3)

Using our Ordinal Logistic Regression Model we find the predicted Weekend Alcohol Consumption for this student will be High (Walc = 4) and their Workday Alcohol Consumption will be Very Low (Dalc = 1)

Social Good

- Understand the underlying problems in students consumption in alcohol.
- Provide further insight on what are the external and internal reasons for consuming alcohol.
- When you want help, please call **1-800-662-4357** SAMHSA's National Helpline.

Conclusion

3 of our Variables indicate a Correlation with Student Alcohol Consumption

- Students that study more generally have lower Workday and Weekend Alcohol consumption
- Students that have more free time generally have higher Workday and Weekend Alcohol Consumption
- Students that go out more frequently generally have higher Workday and Weekend Alcohol Consumption
- We were unable to find enough evidence to determine a correlation between Extracurriculars and Alcohol Consumption

We Believe There Are Many Ways to Improve our Model

- Examine other variables from this dataset
- Run surveys to collect data on other variables not within this dataset
- Expand the data to include students from different majors—not just Portugese and Math students
- Increase the sample to include more universities—instead of just UC Irvine

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Thank you!