

EFFECT OF COVID-19

INDUCED LOCKDOWN ON

MENTAL WELLBEING OF STUDENTS



**Ammar Ateeq
Hashim Naveed
Sidra Aziz**



Agenda

- Introduction
- Research Questions
- Related Works
- Dataset
- Exploratory Data Analysis
- Correlation between Variables
- Data Modeling
- Sentiment Analysis
- Final Conclusion and Findings(Future Work)



Introduction

COVID-19 has had negative consequences on the planet for more than a year, ranging from economic downturns to high mortality tolls that have brought several nations and areas to their knees. We are currently witnessing its catastrophic impacts in the shape of second and third waves, claiming a large number of human lives every day.

A Short Survey About COVID-19 Induced Online Studies And Its Effects on Students' Mental Wellbeing
* Required

The following questions are asked to make sure you belong to the target group of this study.
The scale is measure as 1 being the lowest and 5 being the highest.

Were you motivated to take online classes as compared to regular classes? *

Yes
 No
 Maybe

Please give reason for your previous question's answer below:
Your answer _____

How has been your concentration span during online studies vs. in-person classes/lectures? *

Choose _____

Please share some thoughts or explanation on the concentration span in online studies. *

Your answer _____

Has your sleep been affected during online classes? *

Yes
 No

1 Our study aims at predicting grades of students whether they were same, better or bad during COVID-19 induced online classes.

2 We have also used text mining to understand the sentiments of students through the survey filled out by students.

Research Questions

Research Question 1

Is there a pattern for students to struggle with online study schedules during online classes in COVID-19 times?

Research Question 2

What sentiments can we find through students' open-text descriptive answers to survey questions related to covid-19 lockdown and online semester?

Research Question 3

Can we predict the grades of students' online semester based on relative questions for example loss of a job, financial constraint, feeling of anxiousness or unhappiness etc.?

Related Work

Addressing collegiate mental health amid COVID-19 pandemic

Yusen Zhai, Xue Du, 2020 study found that "It is thus imperative for universities to build awareness of students' mental health needs and concerns, and to empower their students to seek help and support during this biological disaster".

The Covid-19 pandemic and mental health of first-year college students: Examining the effect of Covid-19 stressors using longitudinal data

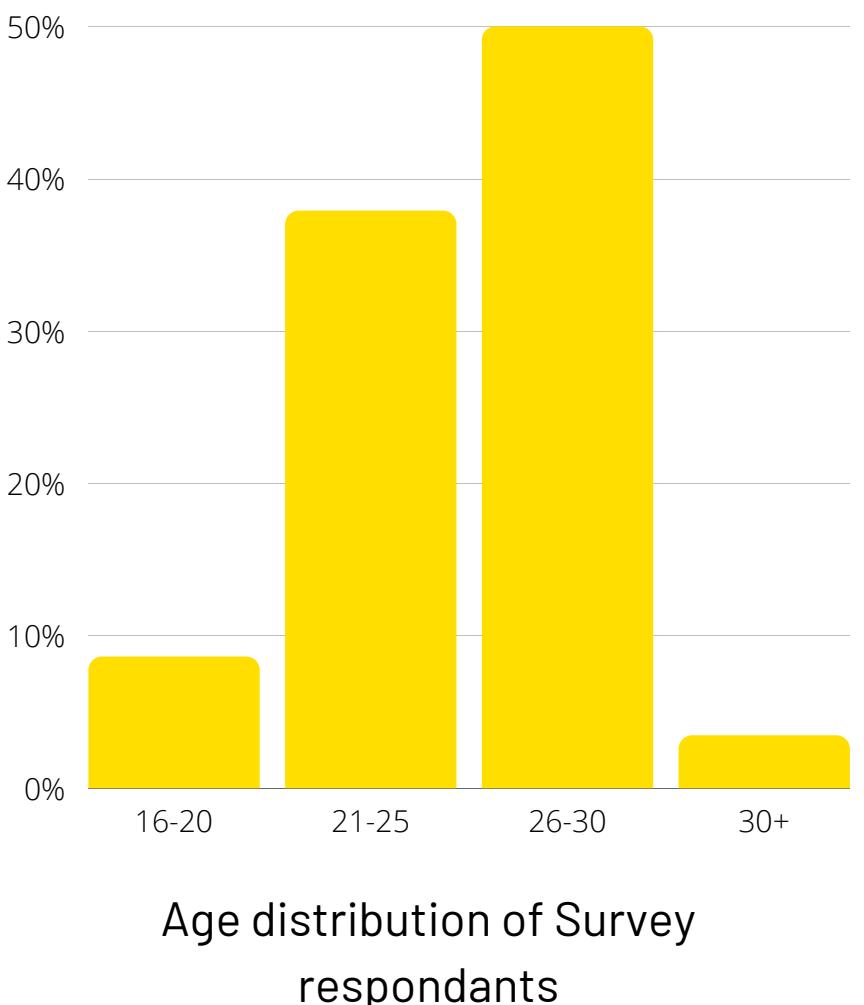
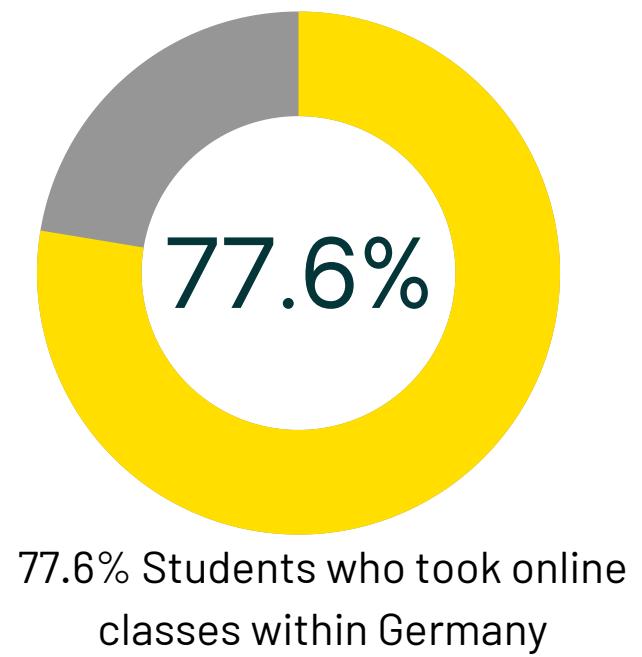
"The prevalence of moderate-severe anxiety increased from 18.1% before the pandemic to 25.3% within four months after the pandemic began; and the prevalence of moderate-severe depression increased from 21.5% to 31.7%."

Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study

"Of importance is that university counseling centers should set up options to continue to provide college students with counseling services at a distance (i.e., telemental health counseling) within the constraints of the pandemic outbreak"

Dataset and EDA

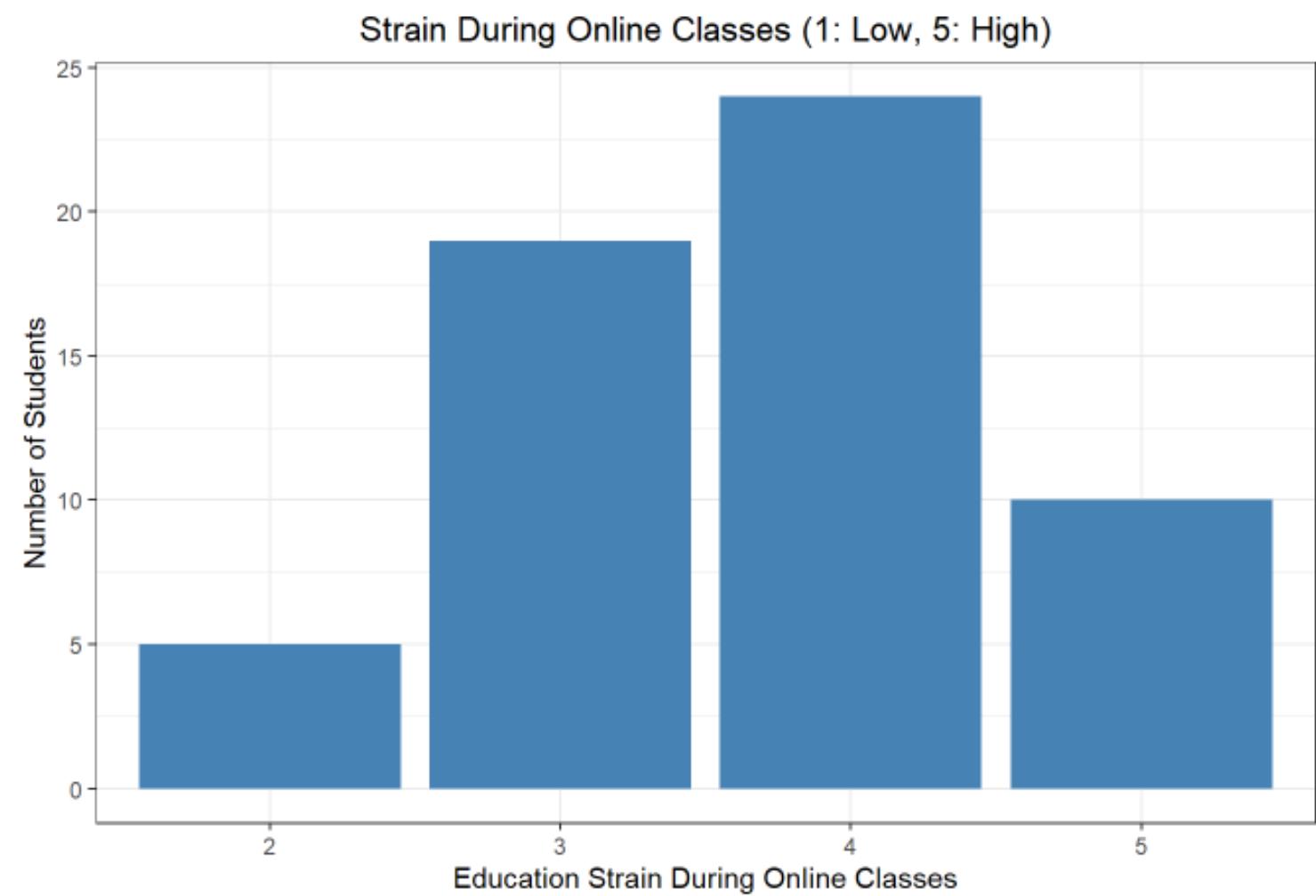
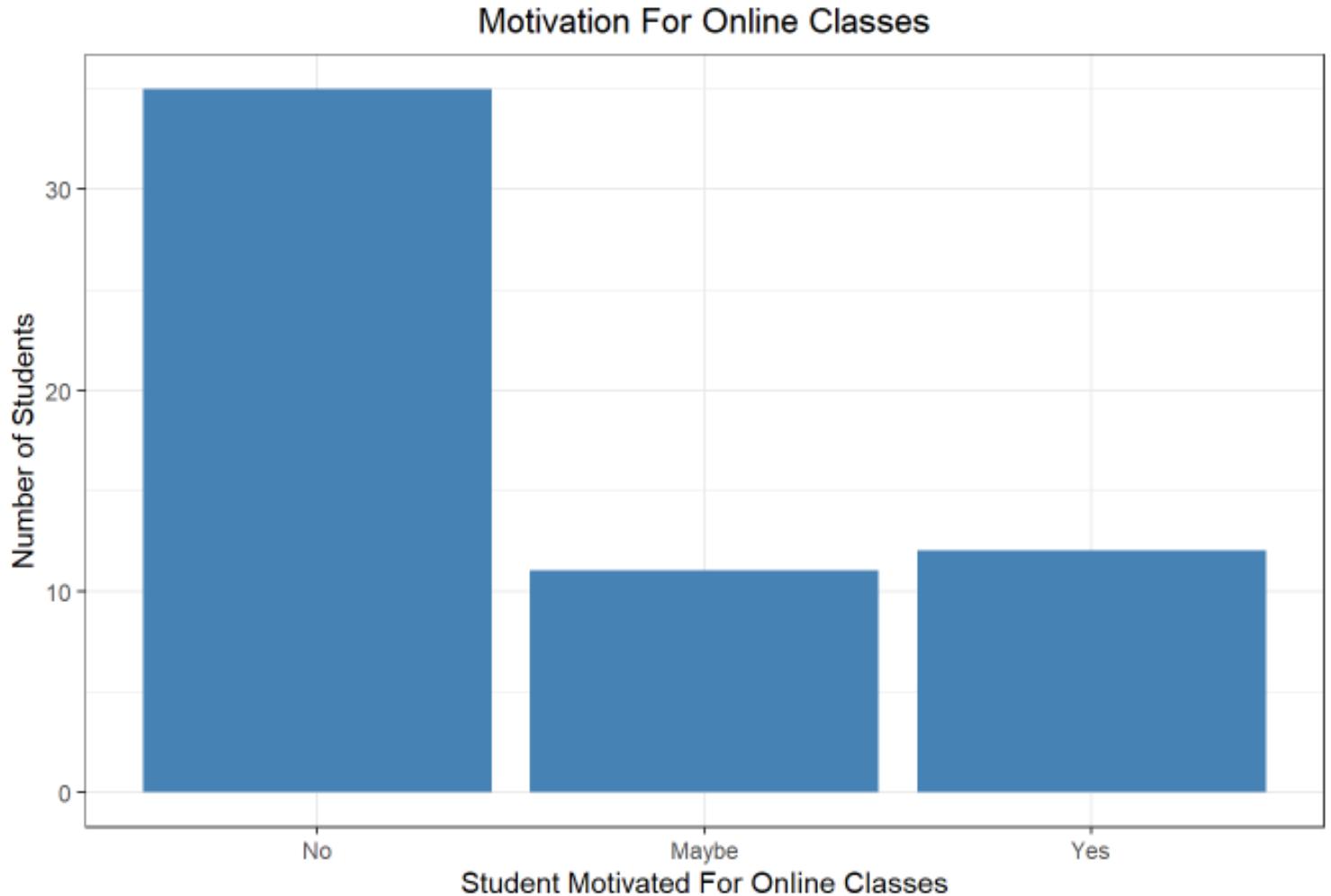
Below is our initial insights from Survey data



58 Survey respondants

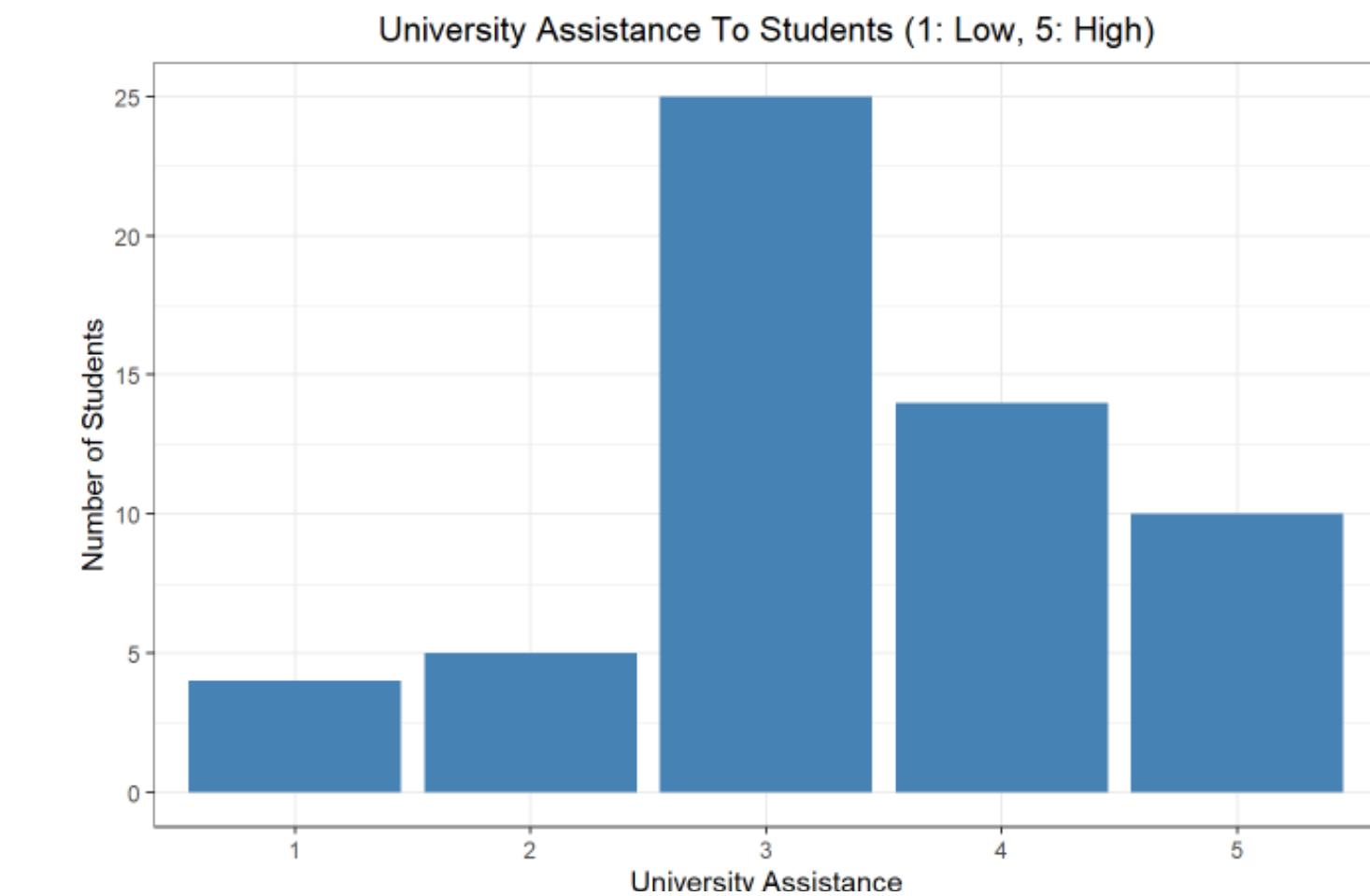
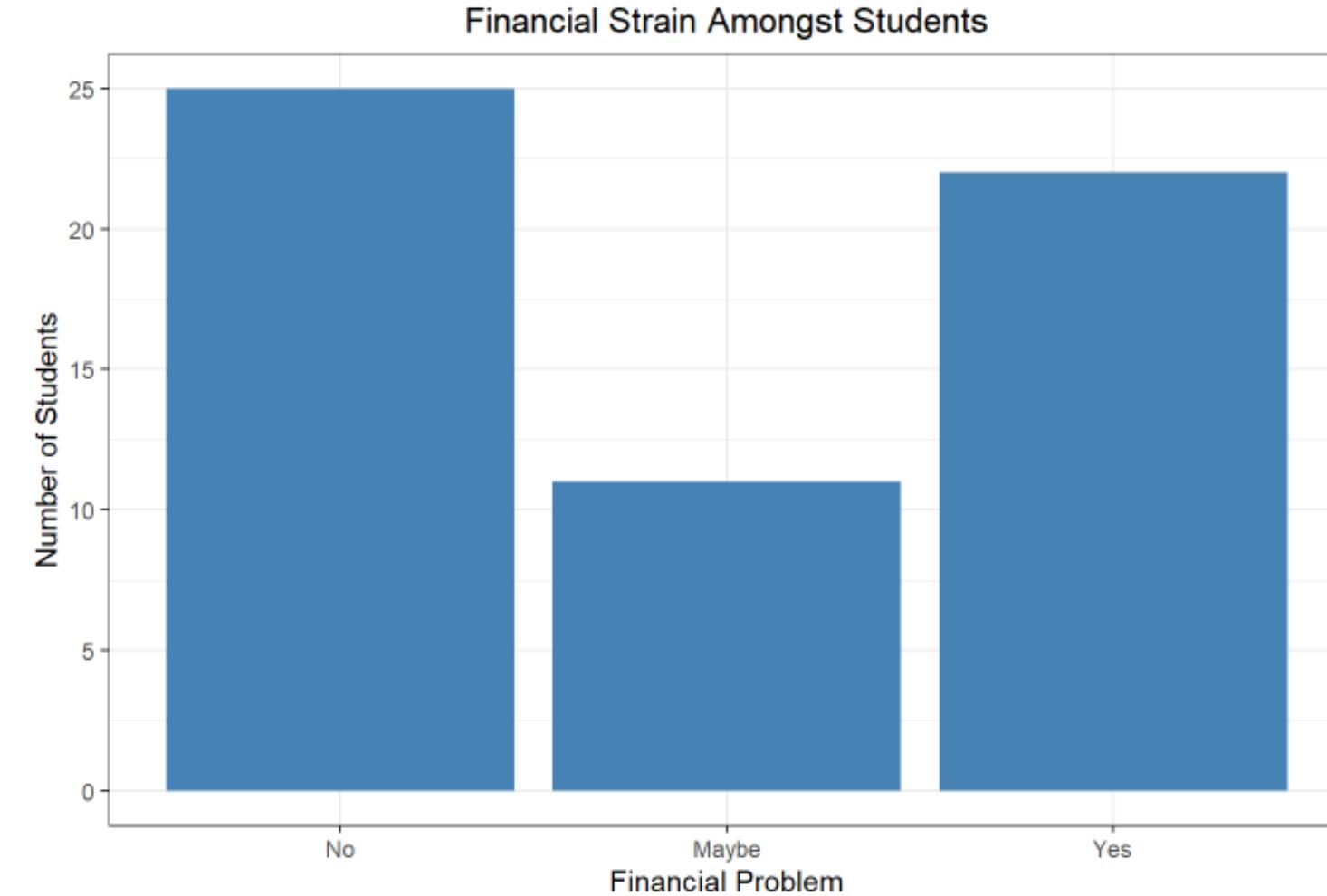
Exploratory Data Analysis

- More than half of the students not motivated for online classes.
- The stress of education on the higher side.



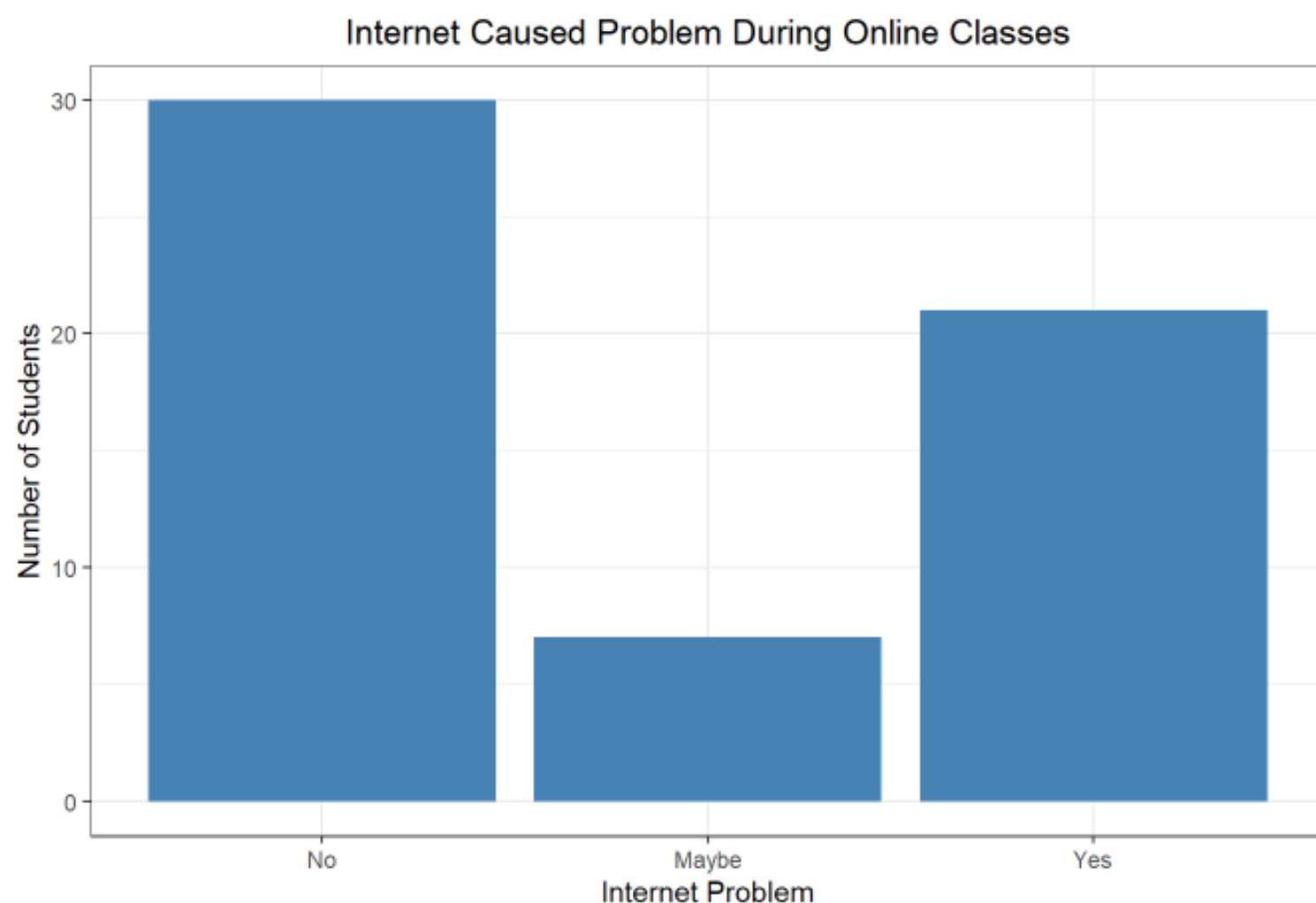
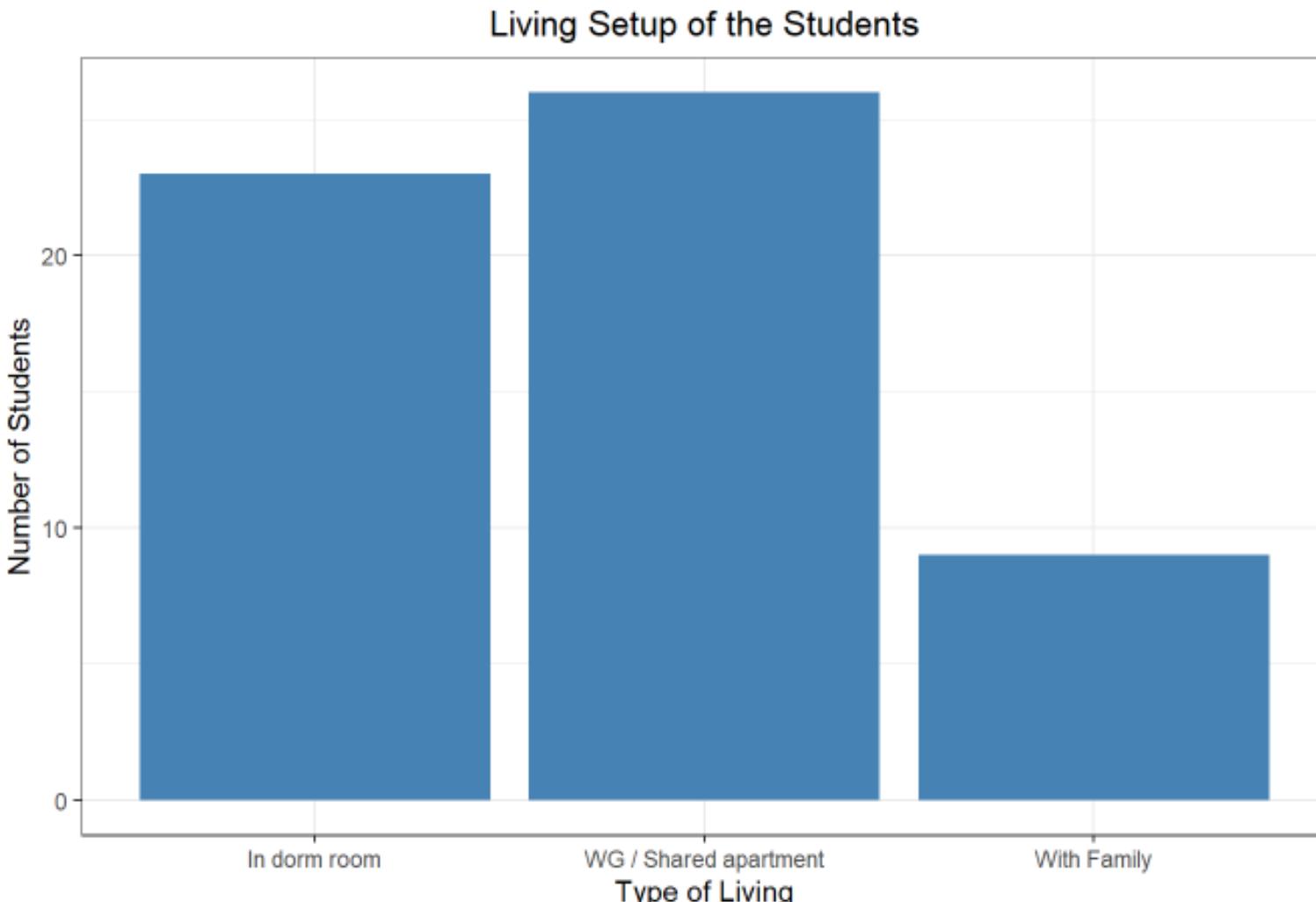
Exploratory Data Analysis

- A little over 1/3 of the students faced financial problems.
- University aided the students during online studies.

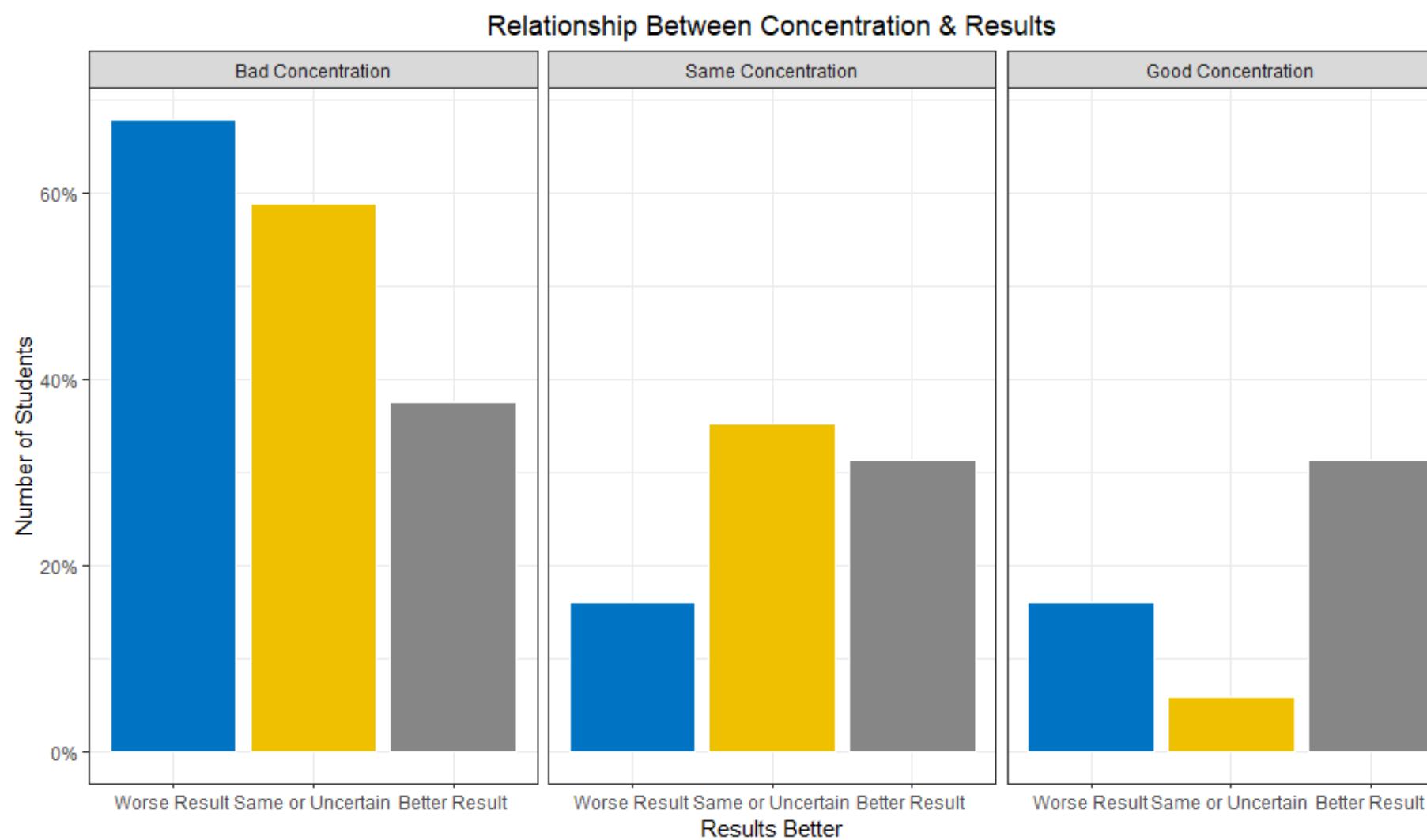


Exploratory Data Analysis

- Most students living in a shared apartment or single room dorm.
- Internet not a major factor. More common for students studying outside Germany.

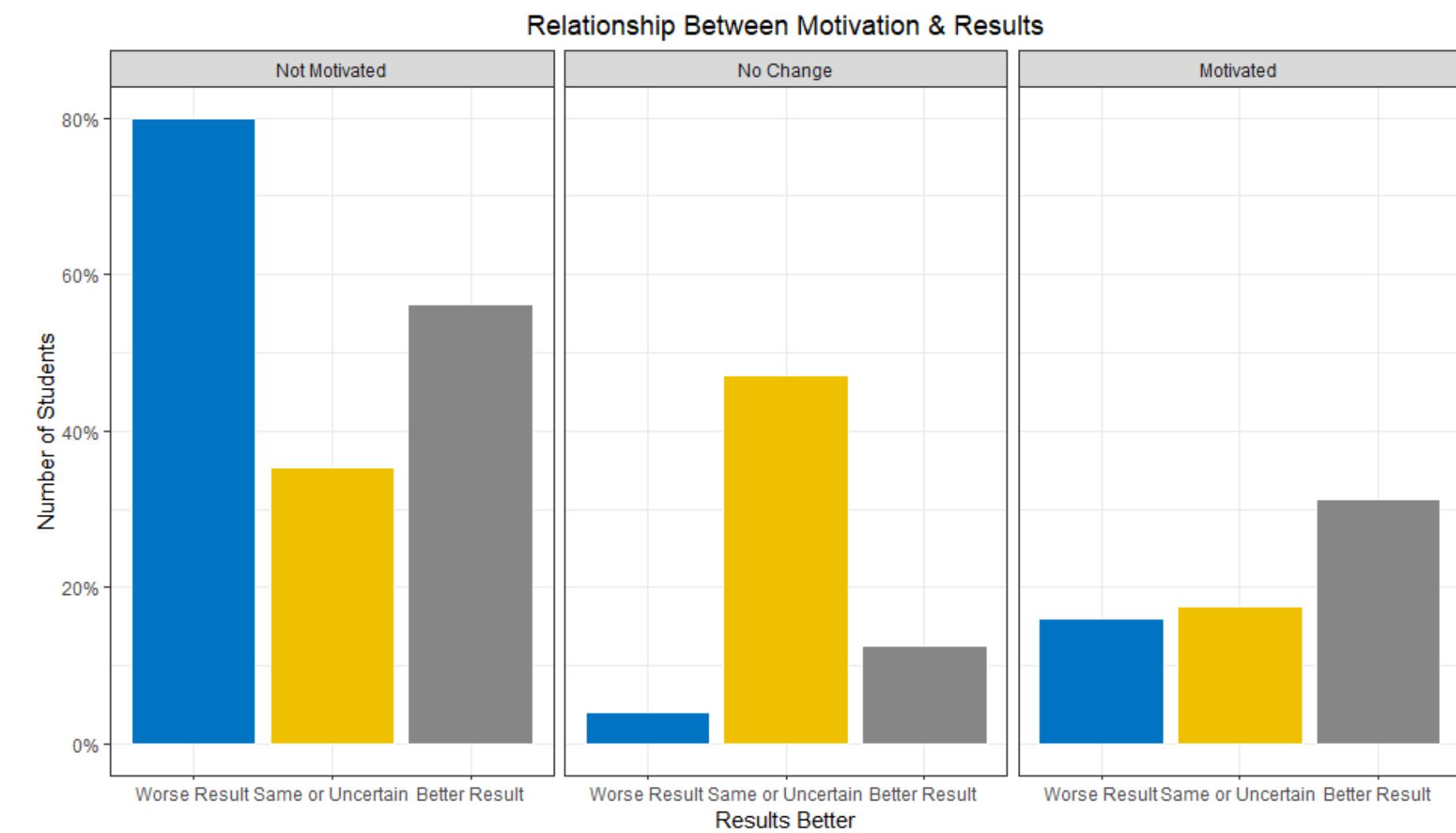


CORRELATIONS BETWEEN VARIABLES



Analysis:

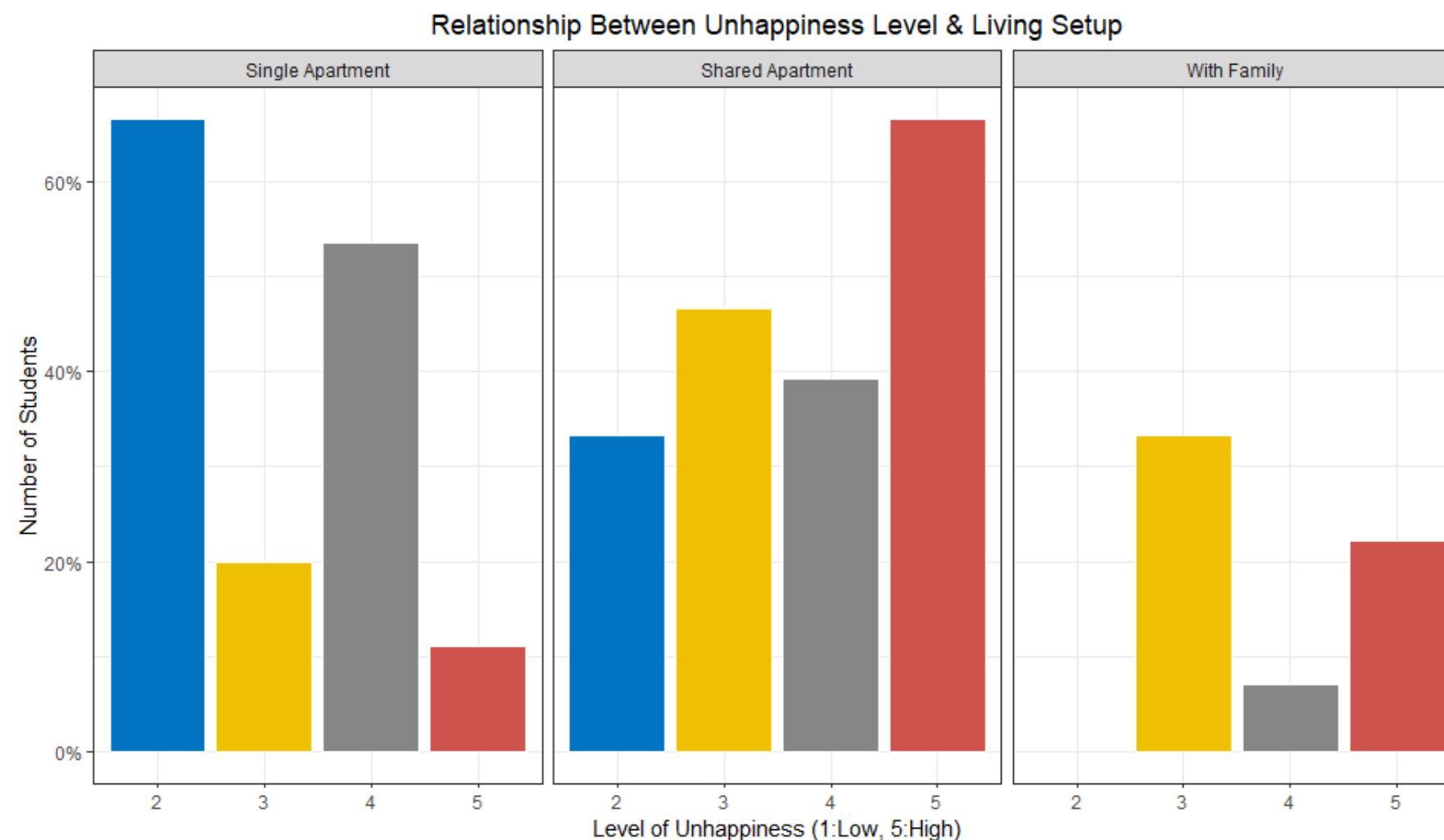
1. Bad concentration led to having bad results/grades.
2. Good concentration has a higher probability of getting better results.



Analysis:

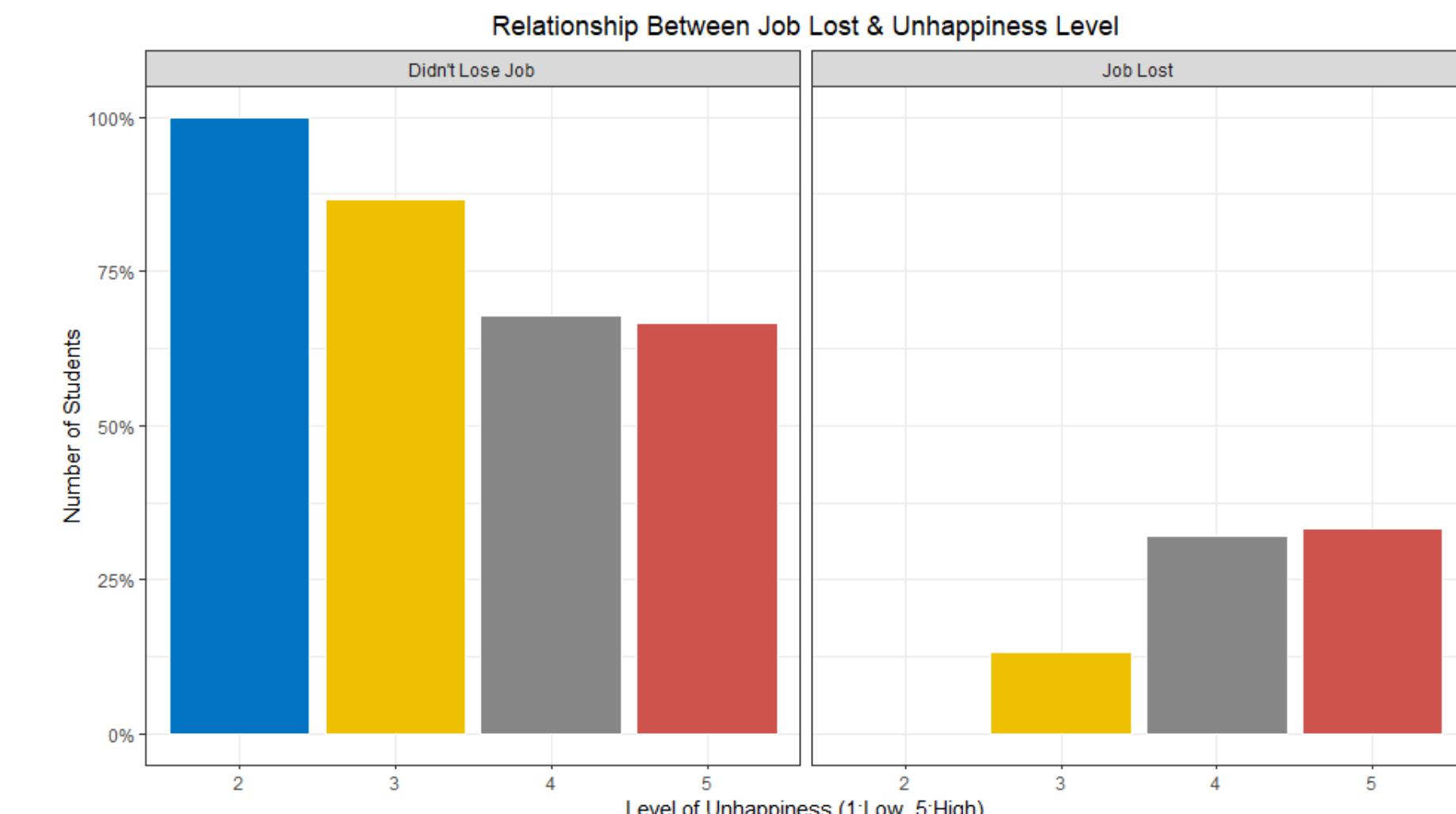
1. Students having less motivation for online studies had worse grades compared to physical classes.
2. Students motivated for online classes perform well in their exams.

CORRELATIONS BETWEEN VARIABLES



Analysis:

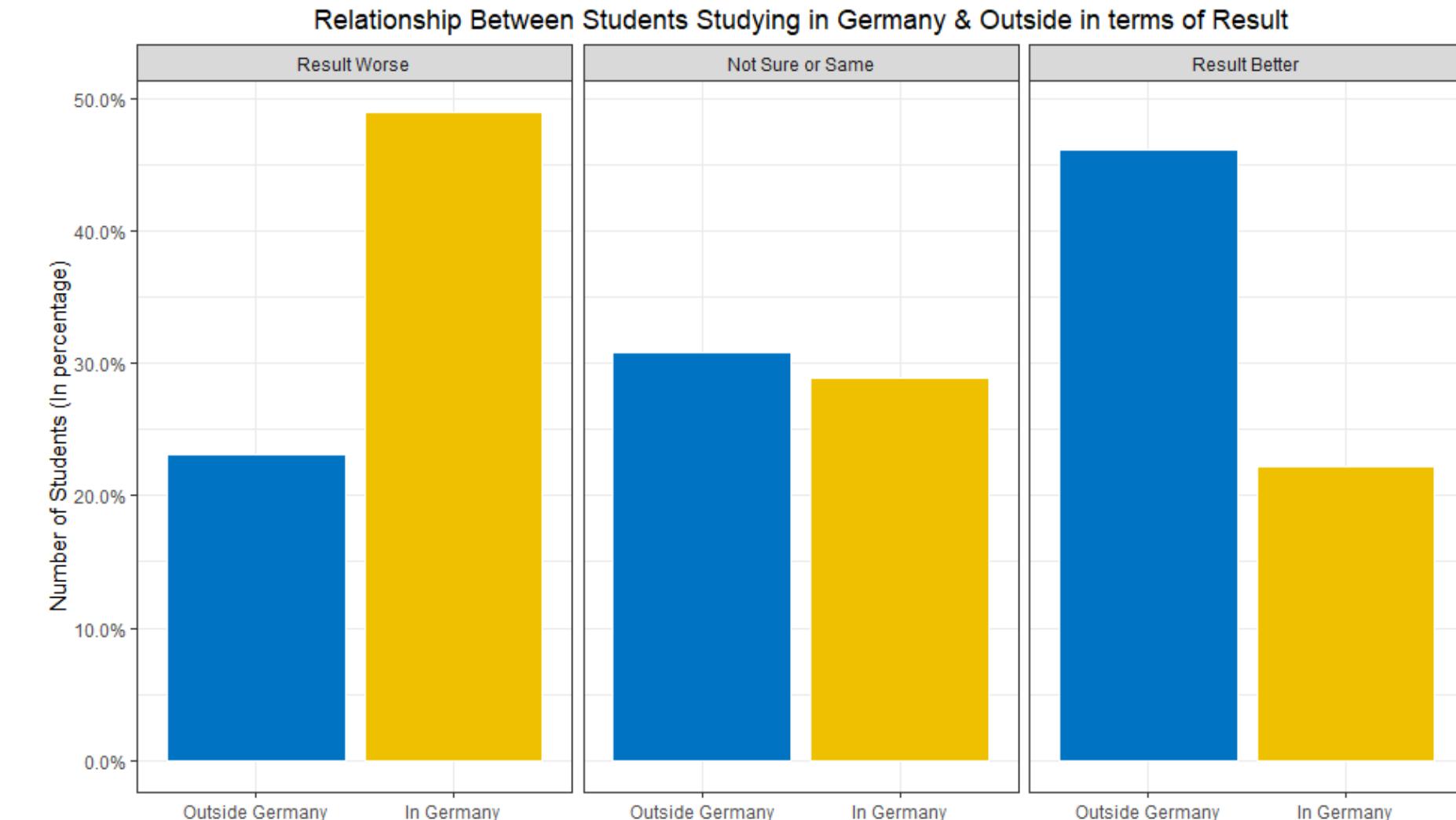
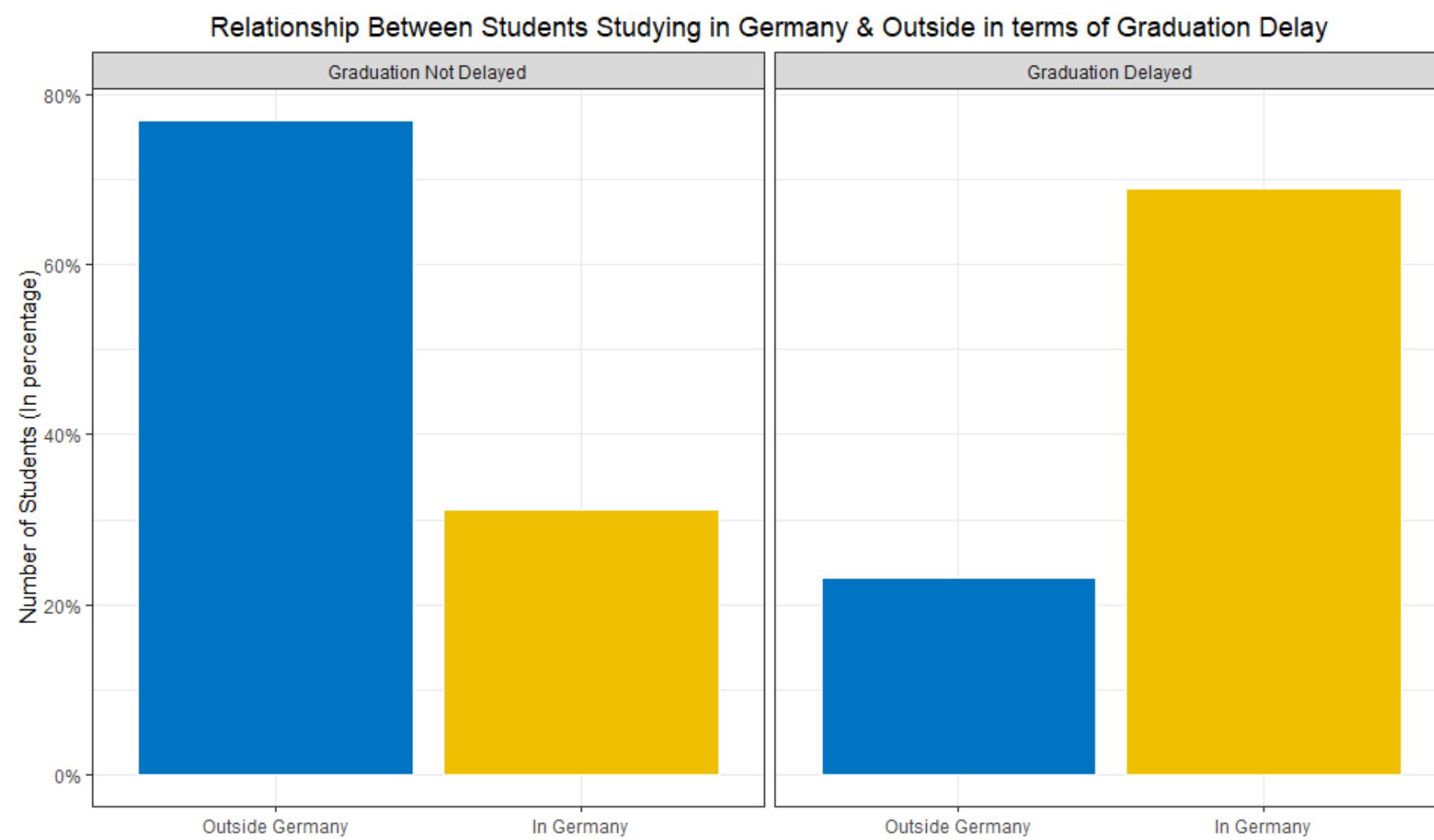
1. Students living in shared apartment had higher level of unhappiness.
2. Single apartment/dorm room students were generally happy/satisfied during online studies



Analysis:

1. Even with less number, indicates a trend that students who lost their jobs were generally less happy.

IN AND OUT OF GERMANY



Analysis:

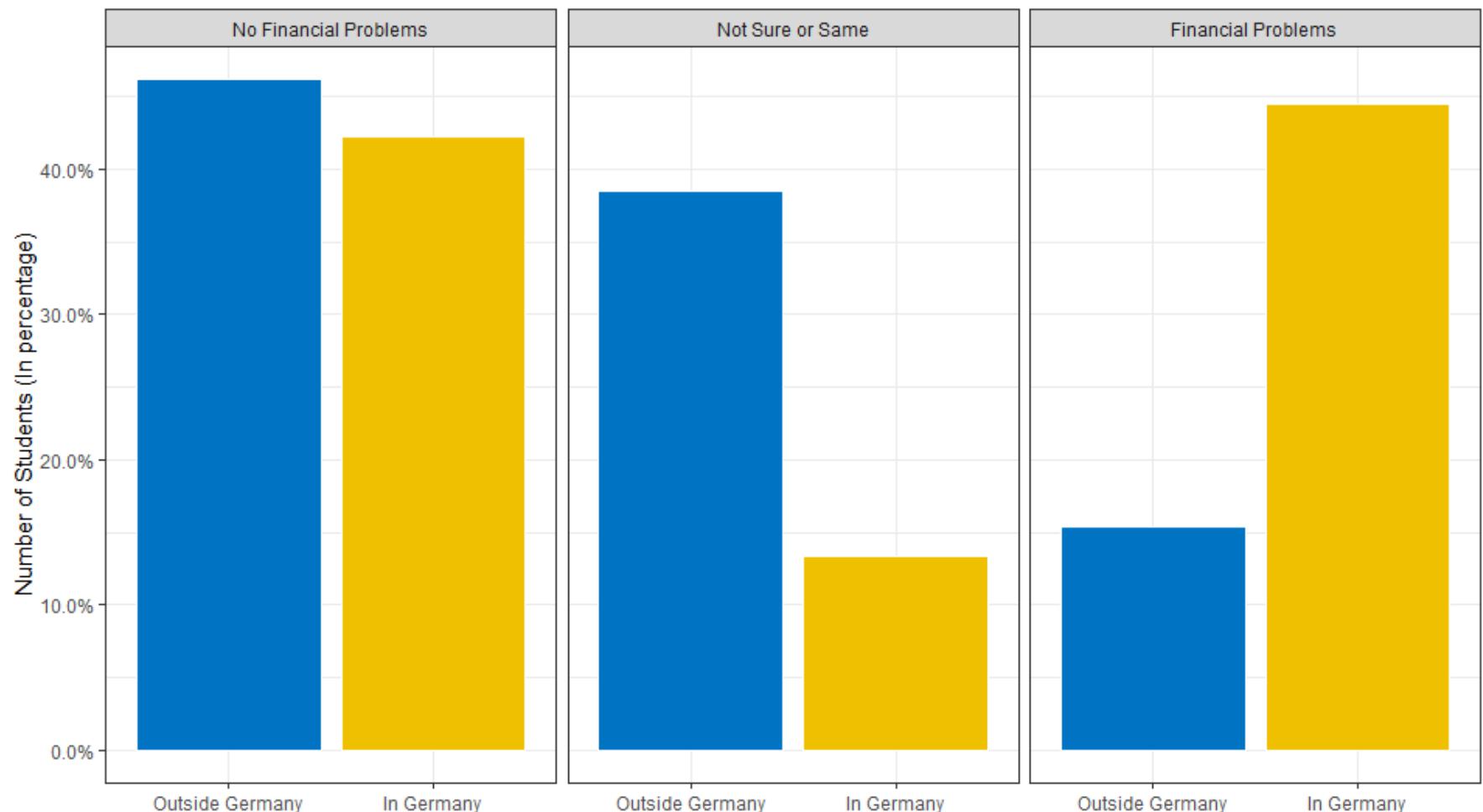
1. Students studying outside Germany didn't have delays in their course schedules.
2. Student's within Germany faced/facing delay in completing their degree on time.

Analysis:

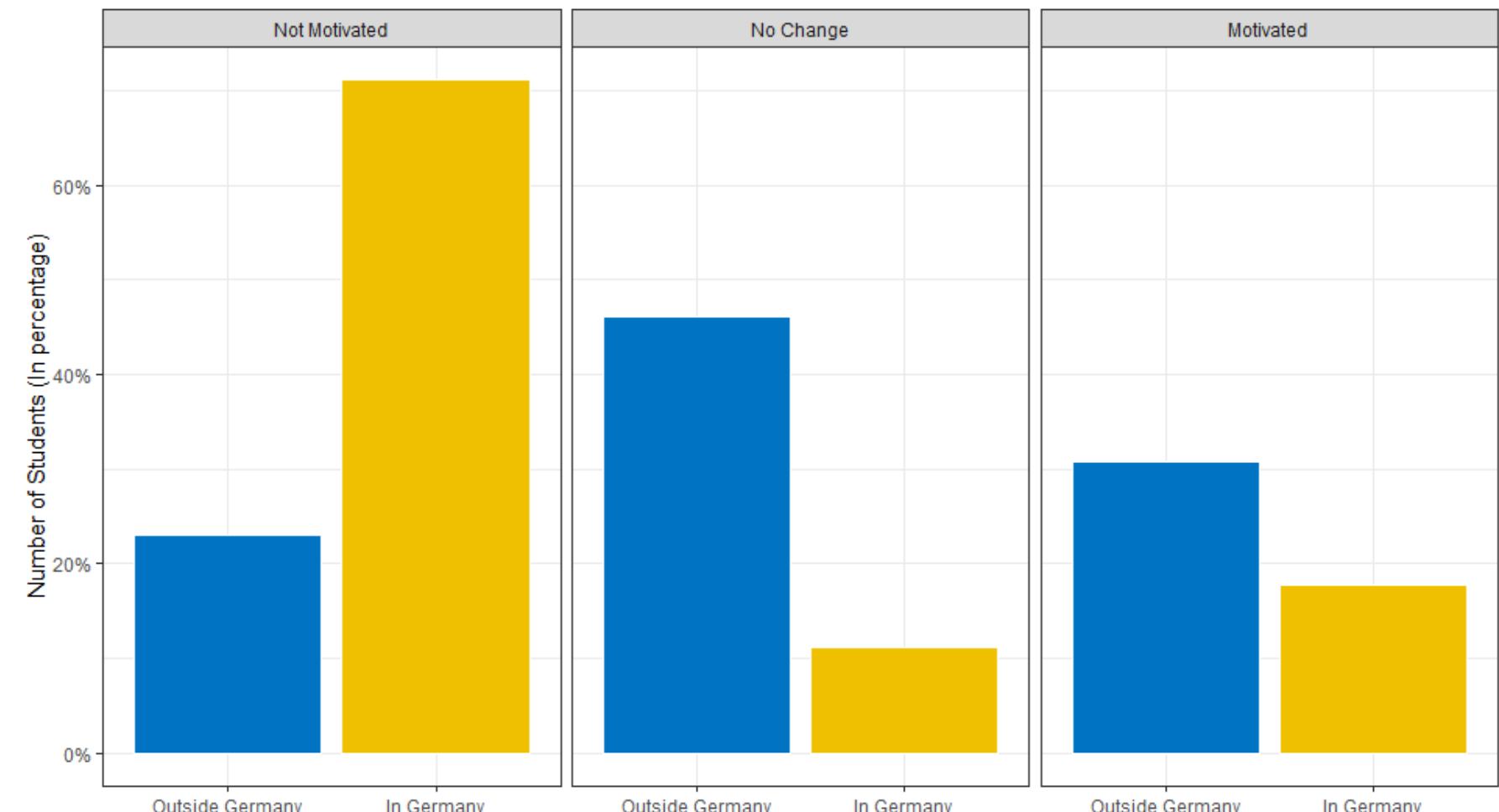
1. Students within Germany had a higher percentage of grades getting worse in online studies.
2. Students outside Germany performed well during online studies.

IN AND OUT OF GERMANY

Relationship Between Students Studying in Germany & Outside in terms of Financial Problems



Relationship Between Students Studying in Germany & Outside in terms of Motivation



Analysis:

1. Students within Germany faced more financial problems compared to students studying outside.
2. More to do with the fact that all but one student living abroad and not with family.

Analysis:

1. Students within Germany have a much higher percentage of having less motivation for online classes.

Multinomial Linear Regression Model

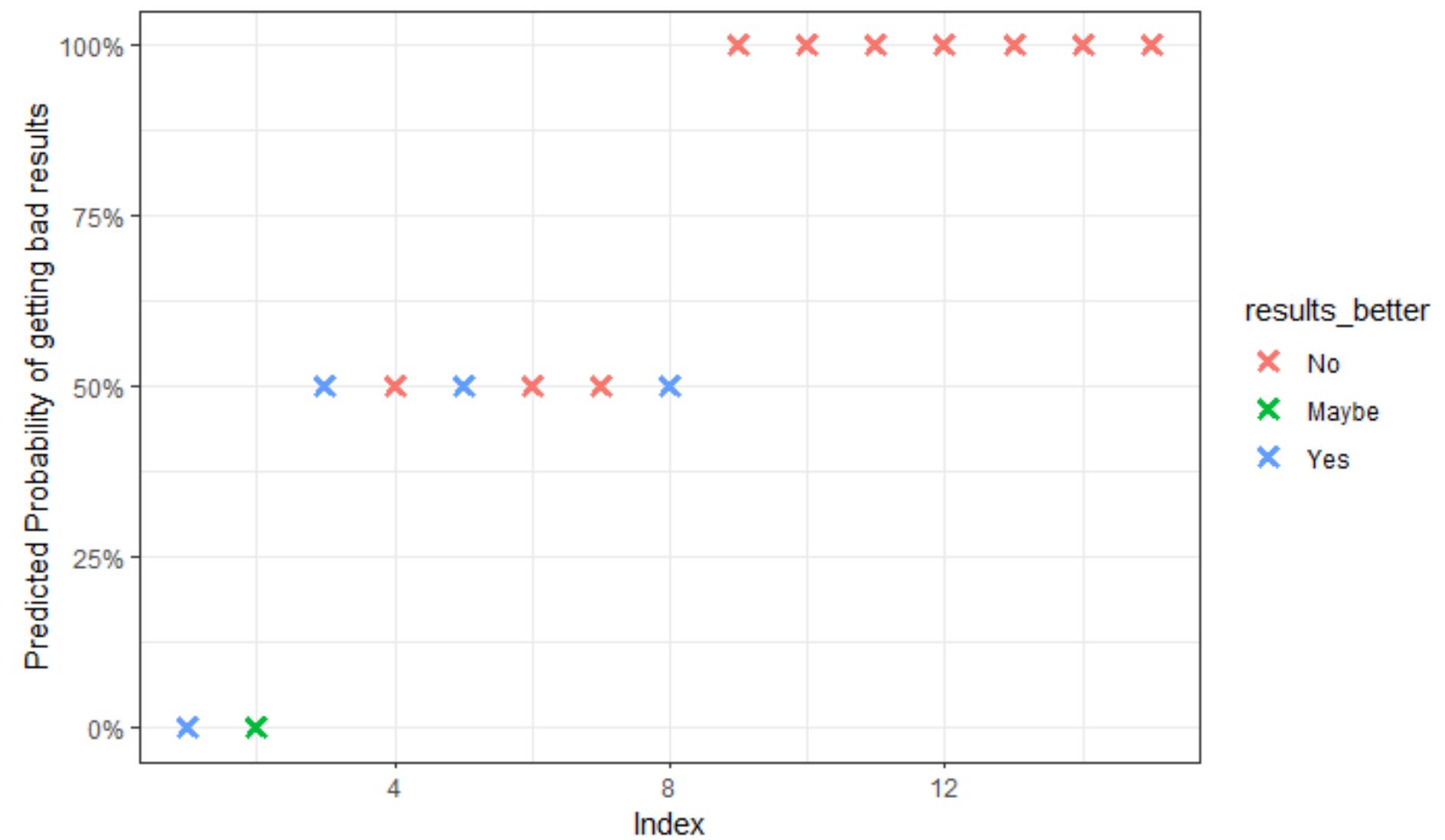
- Used package 'nnet'.
- More than 2 levels for output variable, hence multinomial linear rather than binomial.
- Response variable: result_better.
- Predictors: graduation_effect, education_strain, feeling_unhappiess, study_in_germany, financial_problem.
- Split ratio 75:25

Result

- Accuracy: 87.6% , Kappa Value: 0.72
- Misclassification: 13.3%

Confusion Matrix for
Predicted & Actual
Classification

		Actual		
		No	Maybe	Yes
No	No	9	0	1
	Maybe	0	1	0
Yes	Yes	1	0	3



Random Forest Models

- The function train() from Caret Package used for model building.
- Random Forest was chosen as because of mostly categorical data available.
- Comparison of 3 models were done on the basis of their Accuracies and Kappa values.

Models Settings

- The Training and Testing data was set to a conventional 75% and 25% respectively.
- The models were built using different set of parameters to attain the best possible results.
- Repeated K-fold cross validation was adapted as validation scheme. Our models have 10 folds being repeated 3 times.

Formulae for Models

Predictor as
"concentration"

C

Model 1

```
fit.rf <- train(concentration ~ education_strain +  
  country_study + sleep + graduation_effect +  
  internet + job_lost + stranded_outside +  
  financial_problem  
  , data=so_training)
```

Predictor as
"results_better"

R

Model 2

```
fit.rf2 <- train(results_better ~  
  study_in_germany + graduation_effect +  
  financial_problem  
  , data=so_training)
```

Predictor as
"motivation"

M

Model 3

```
fit.rf3 <- train(motivation ~  
  feeling_unhappiness + sleep +  
  graduation_effect + stranded_outside +  
  internet + job_lost  
  , data=so_training)
```

Results and Interpretations

The results insist that there is 68.66% chance of a student being less motivated when a student feels unhappiness, sleeps less, have delayed graduation, was stranded outside of Germany, has no internet and with job lost.

The results also convey that there exist 66.9% chance of student's result is bad when a student is not studying in Germany, the graduation is delayed and have a financial problems.

67.5% probability of student having a hard time concentrating on studies when there is high education strain, less sleep, delayed graduation, internet problems, with job lost, when stranded outside of Germany and have financial problems

Models Comparision (1)

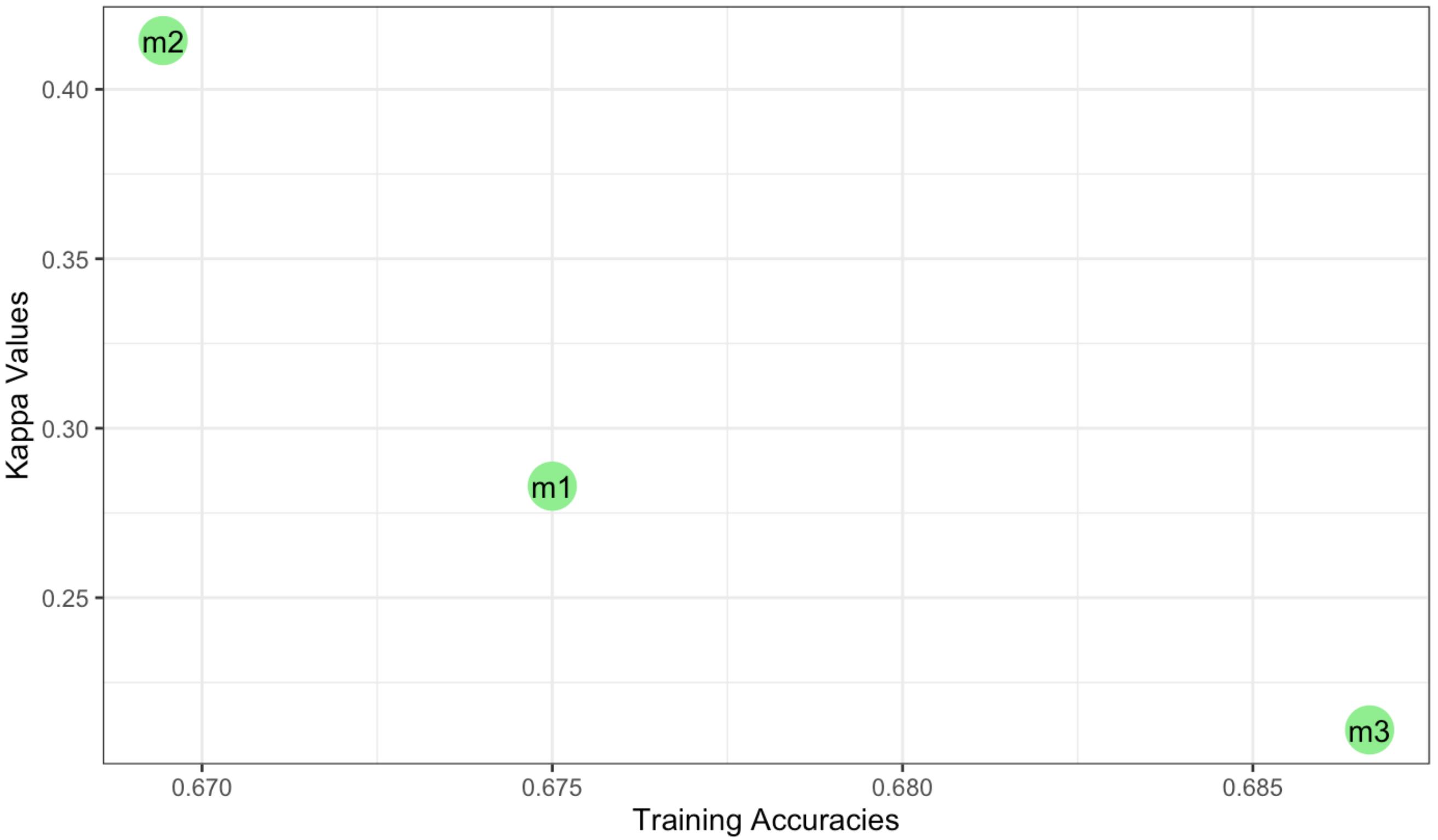


Figure 25

Models Comparsion (2)

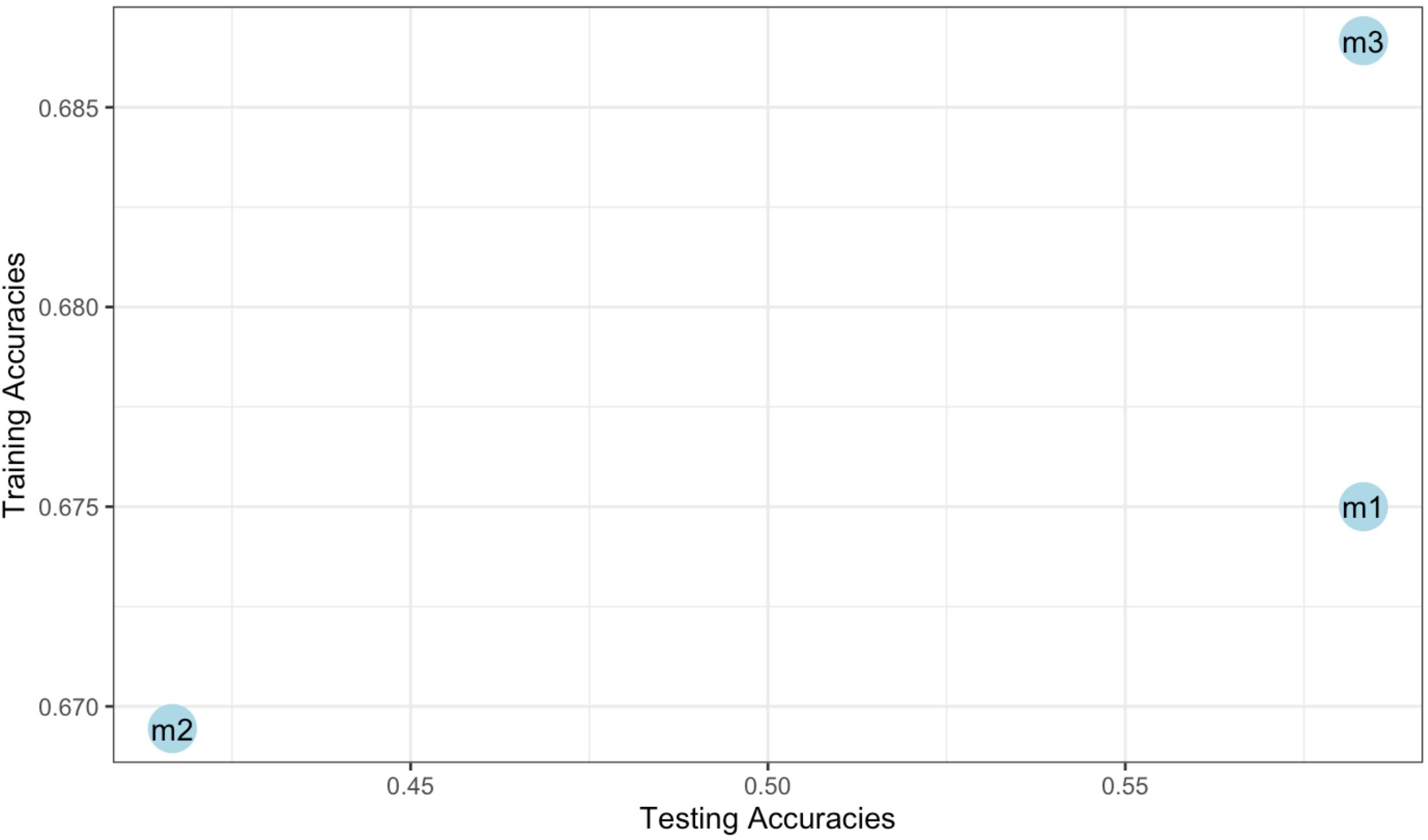


Figure 24



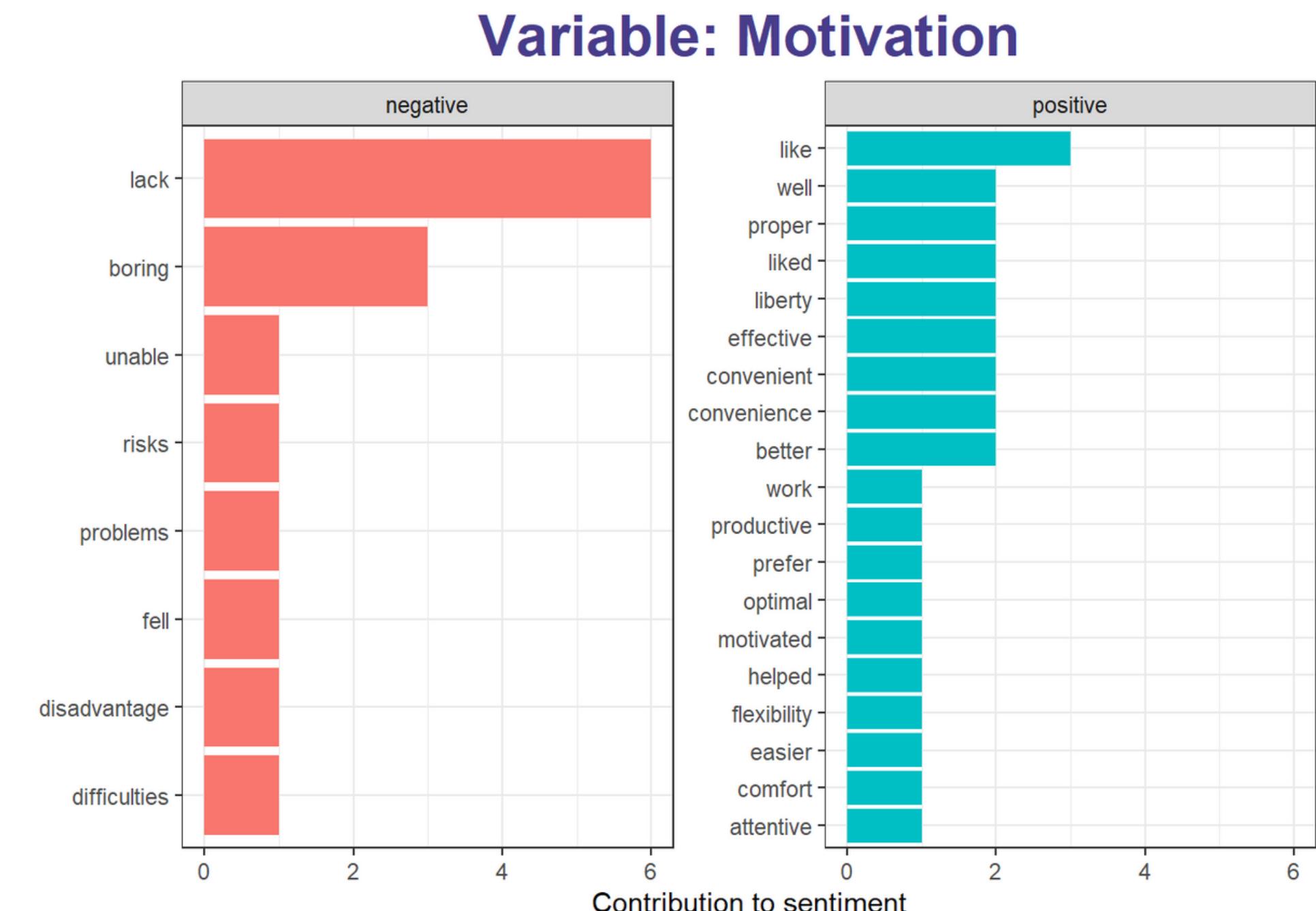
Text Mining and Sentiment Analysis



- We have used text mining techniques and tried to find out the sentiment behind textual data.
 - The textual data is attained from our survey.
 - Word cloud and contribution of a variable is calculated side by side.

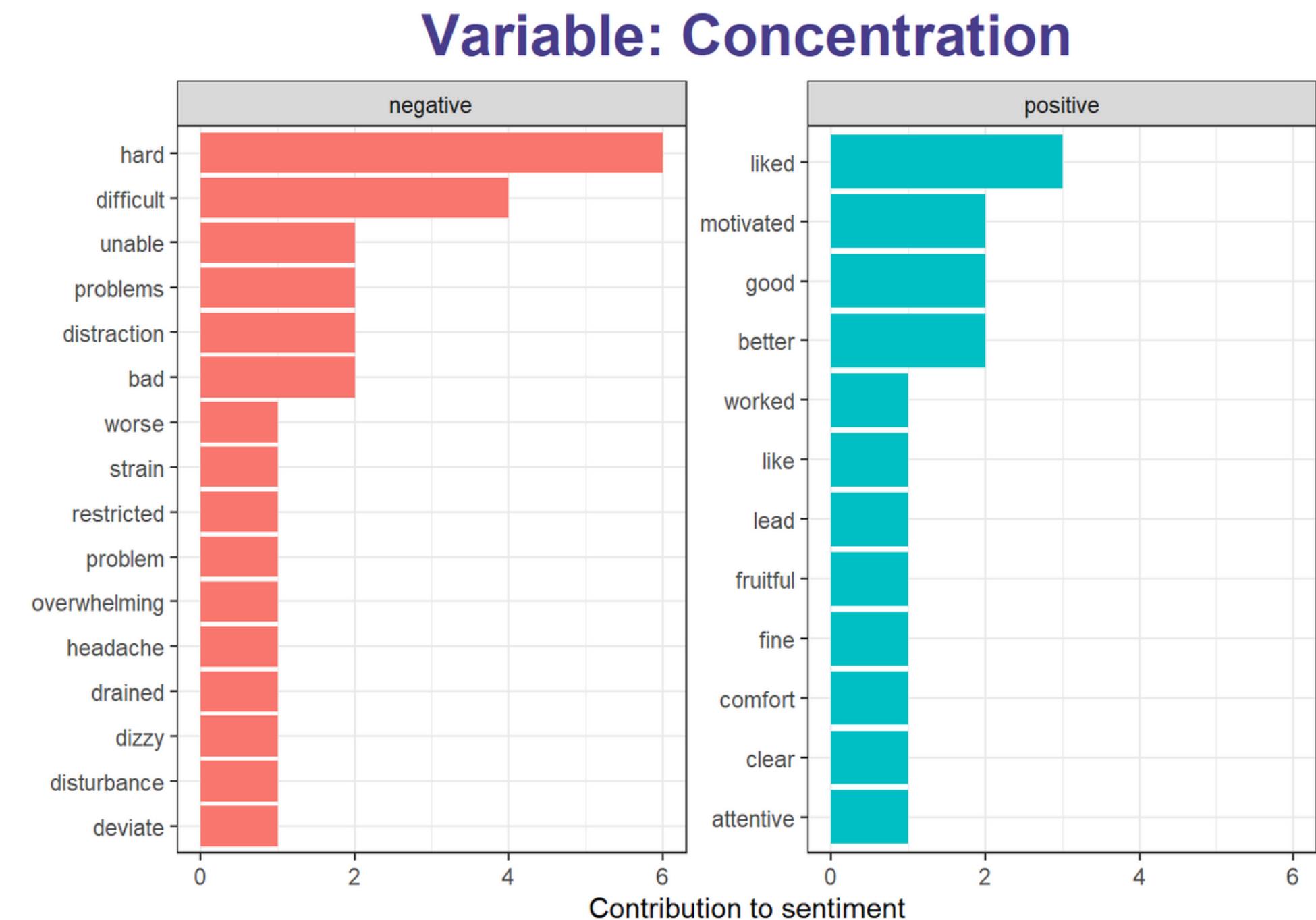
Word Cloud and Text Contribution

"MOTIVATION"



Word Cloud and Text Contribution

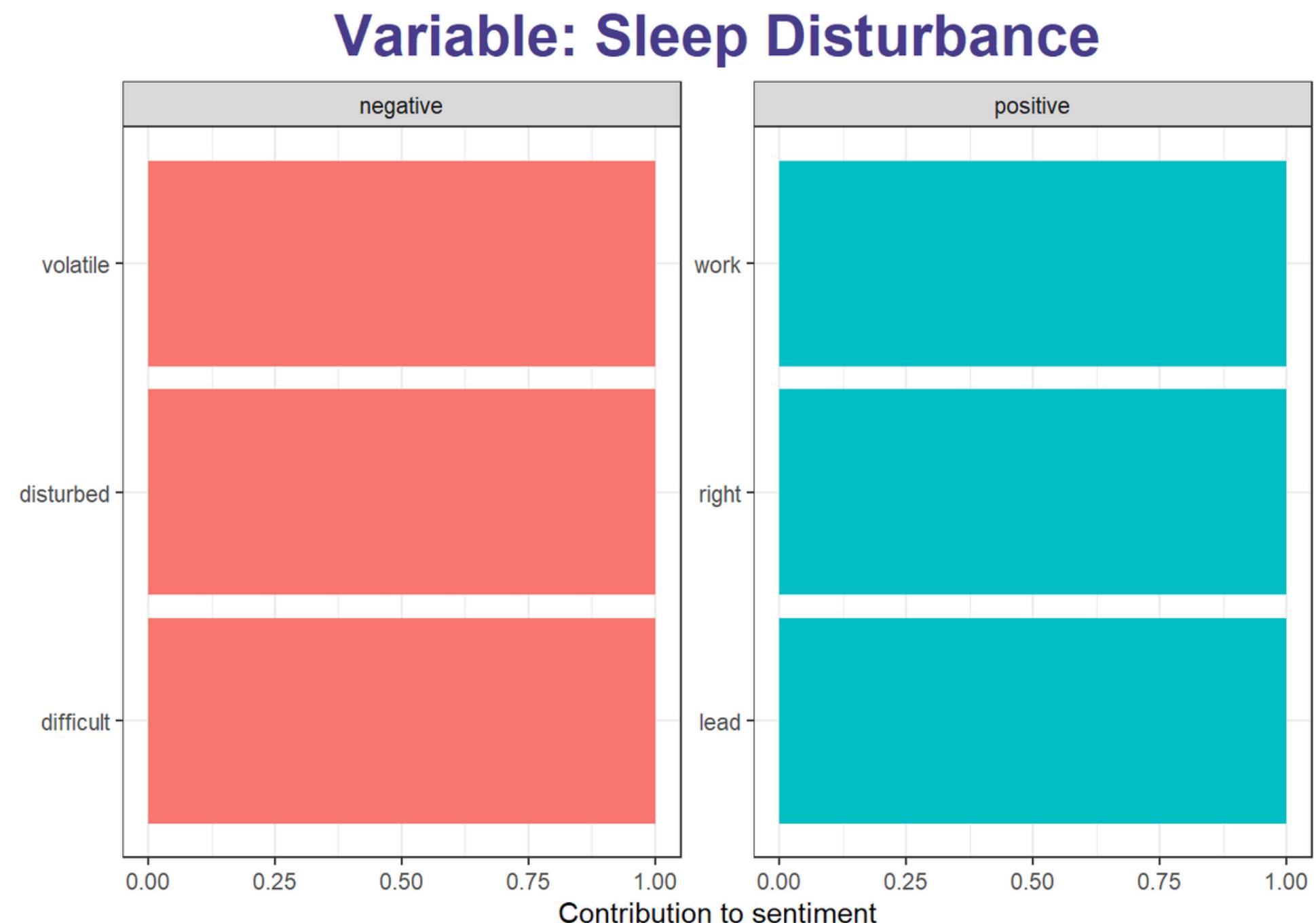
"CONCENTRATION"



Word Cloud and Text Contribution

"SLEEP DISTURBANCE"

volatile
disturbed
difficult
lead
right
work

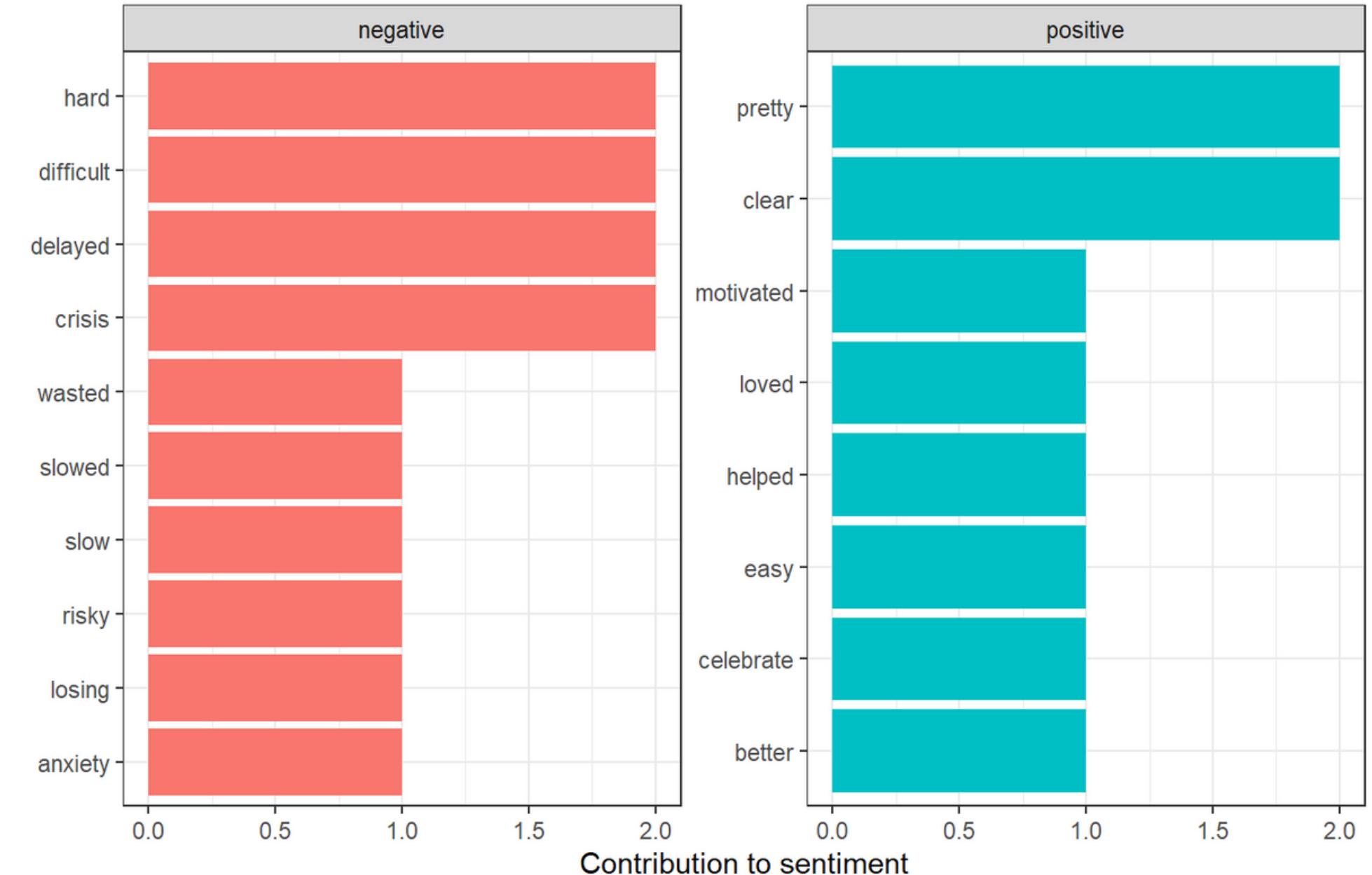


Word Cloud and Text Contribution

"GRADUATION DELAYED/EFFECTED"

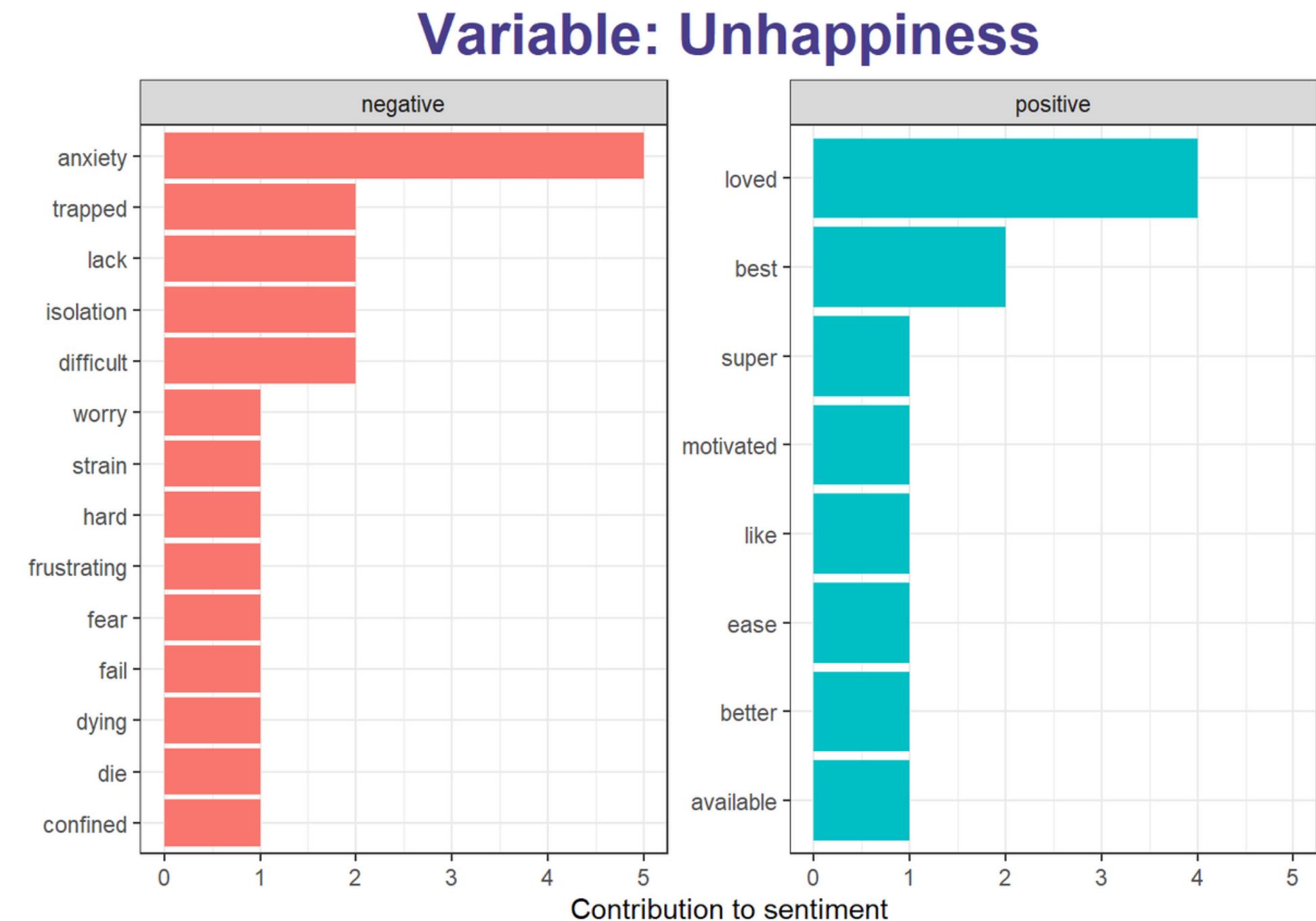
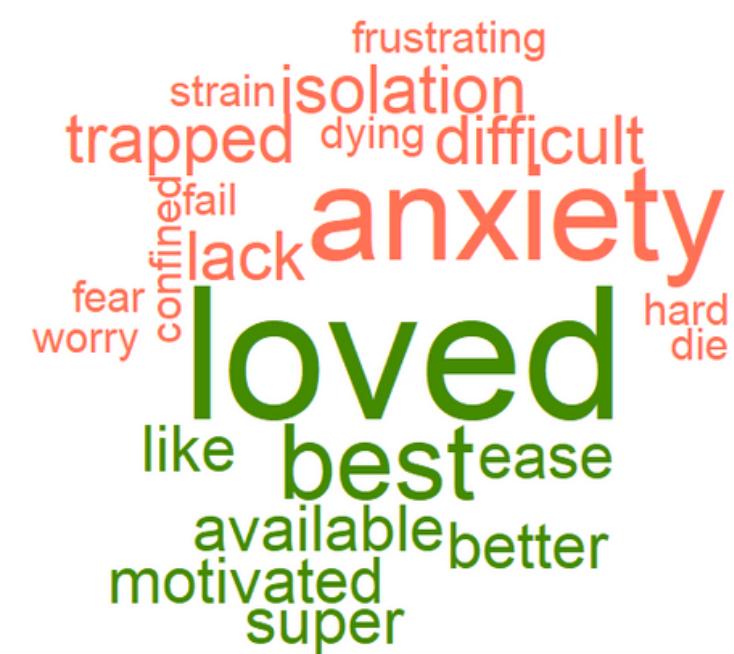


Variable: Graduation Delayed/Effected



Word Cloud and Text Contribution

"UNHAPPINESS"

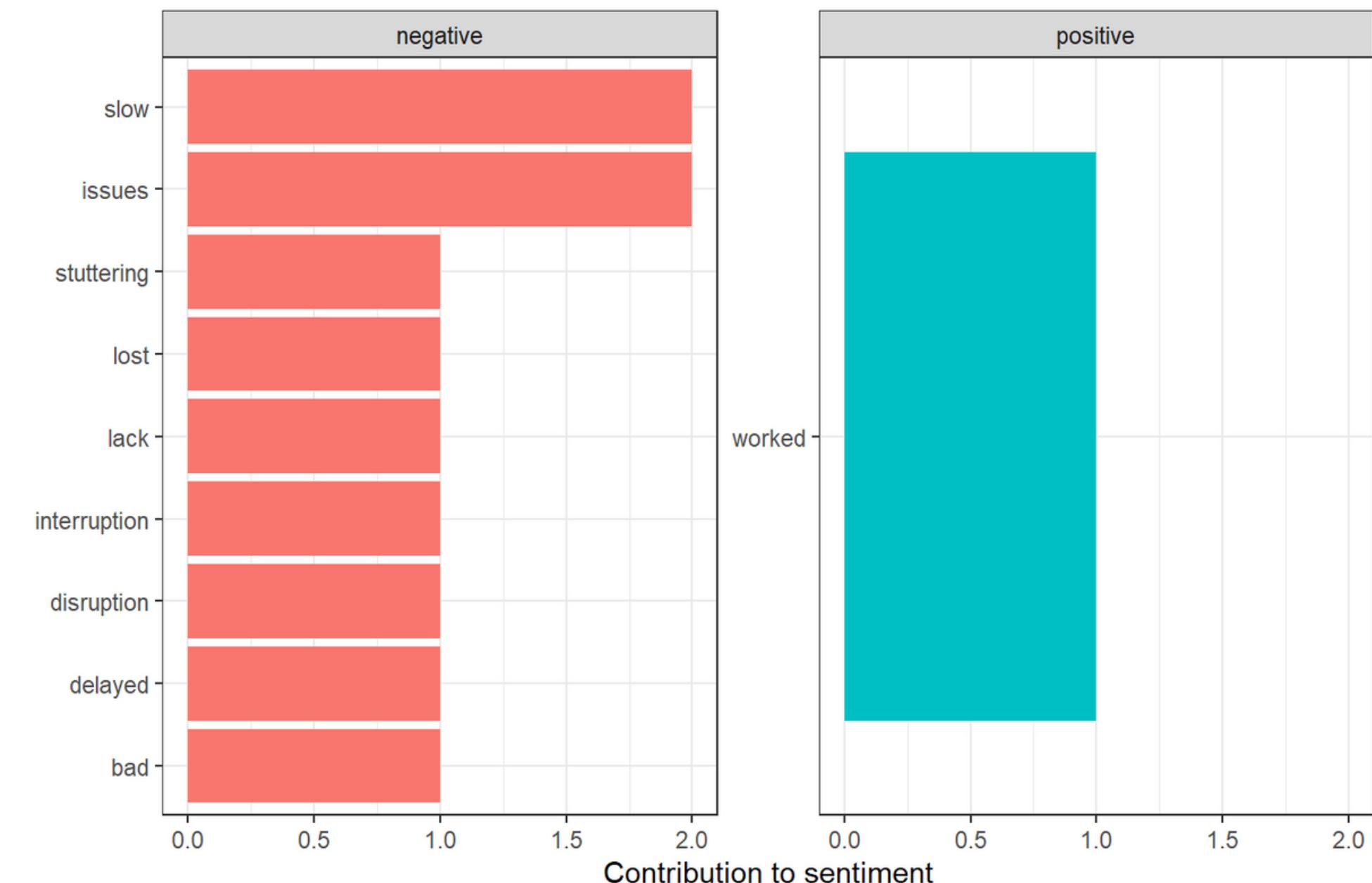


Word Cloud and Text Contribution

"INTERNET PROBLEMS"

interruption
disruption
delayed
lack
slow
lost
bad
issues
stuttering
worked

Variable: Internet Problems

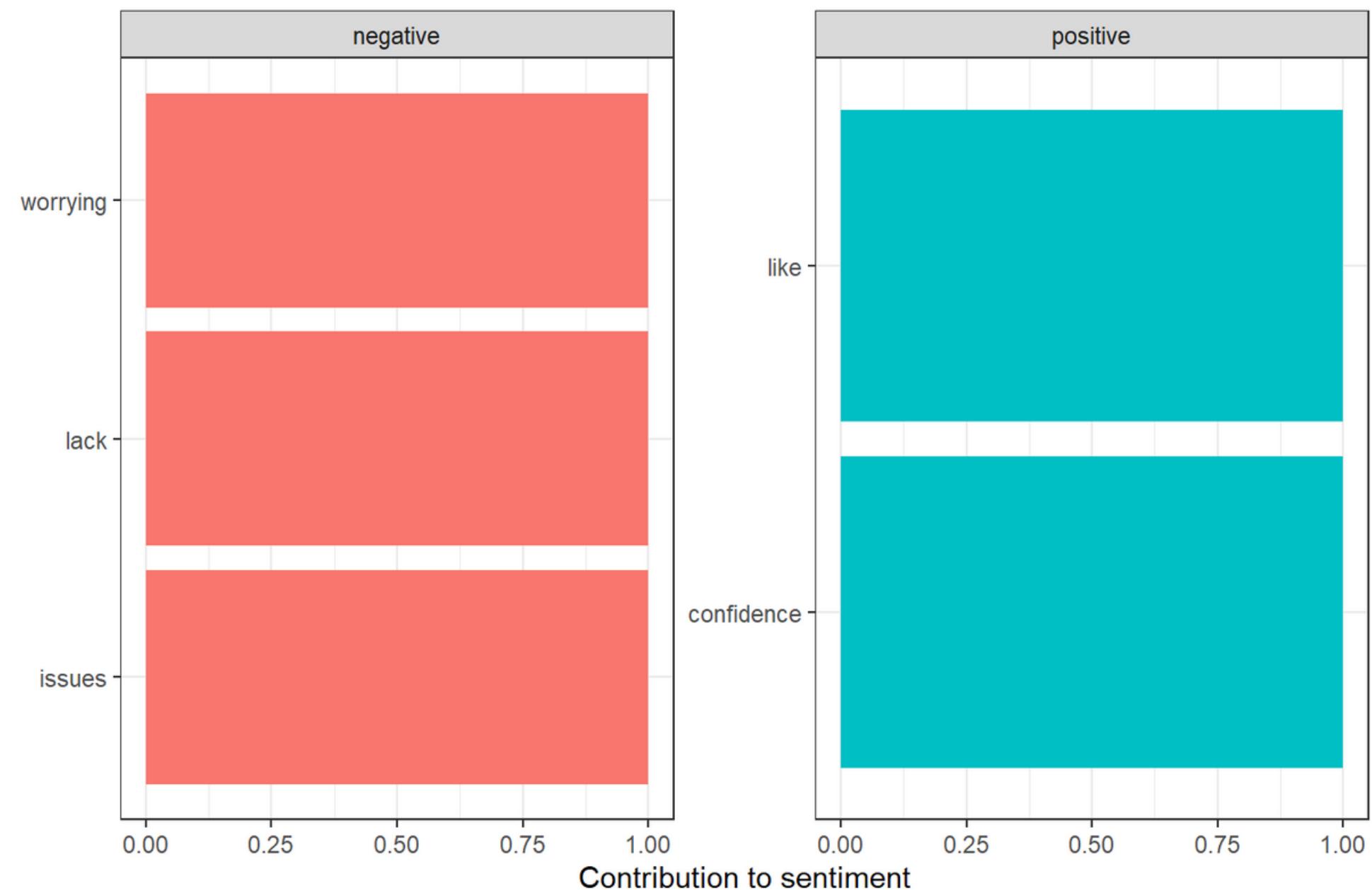


Word Cloud and Text Contribution

"ABLE TO TAKE FULL COURSES"

worrying
lack
issues
confidence
like

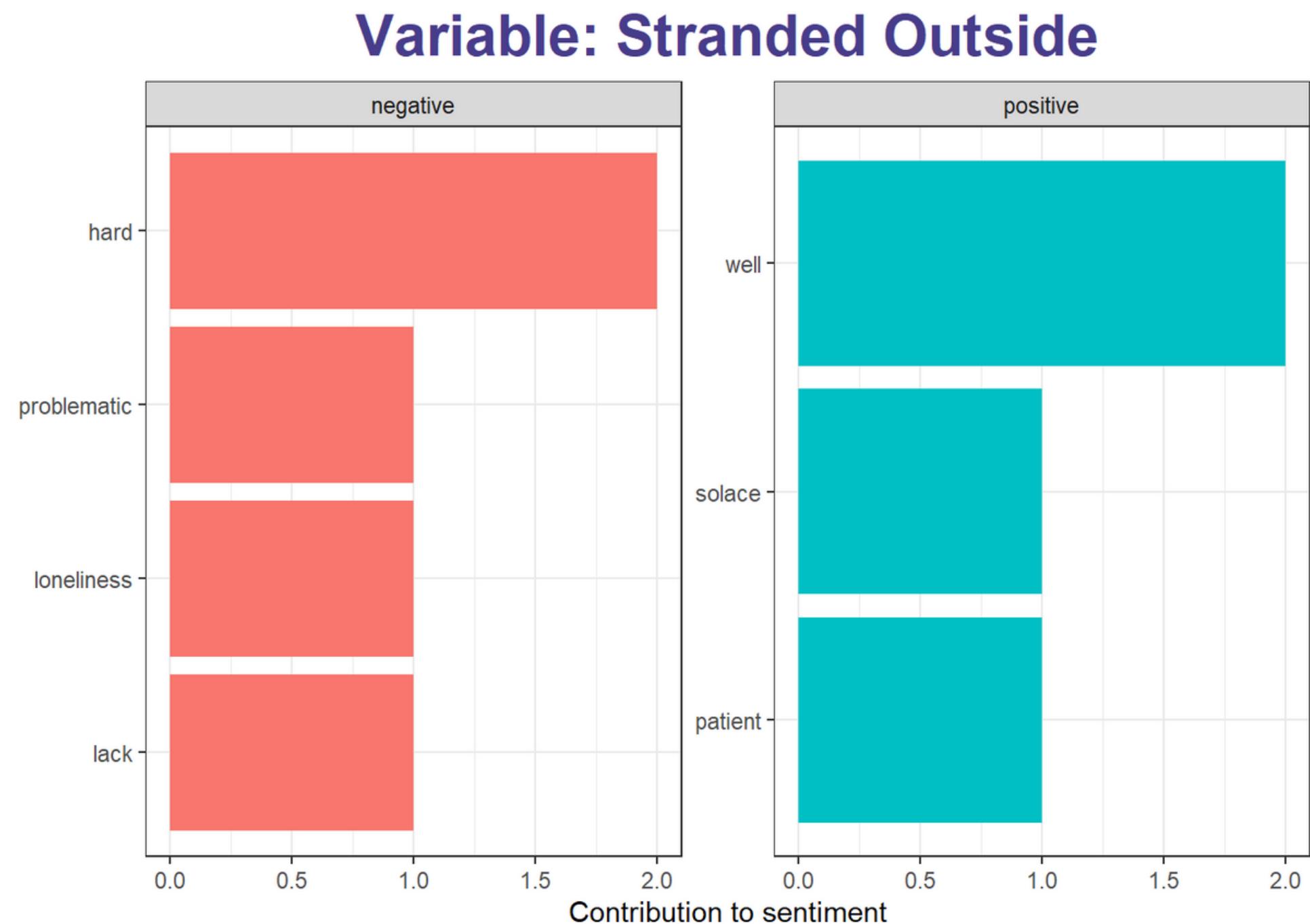
Variable: Able to Take Full Courses



Word Cloud and Text Contribution

"STRANDED OUTSIDE"

problematic
loneliness
lack
hard
well
patient
solace

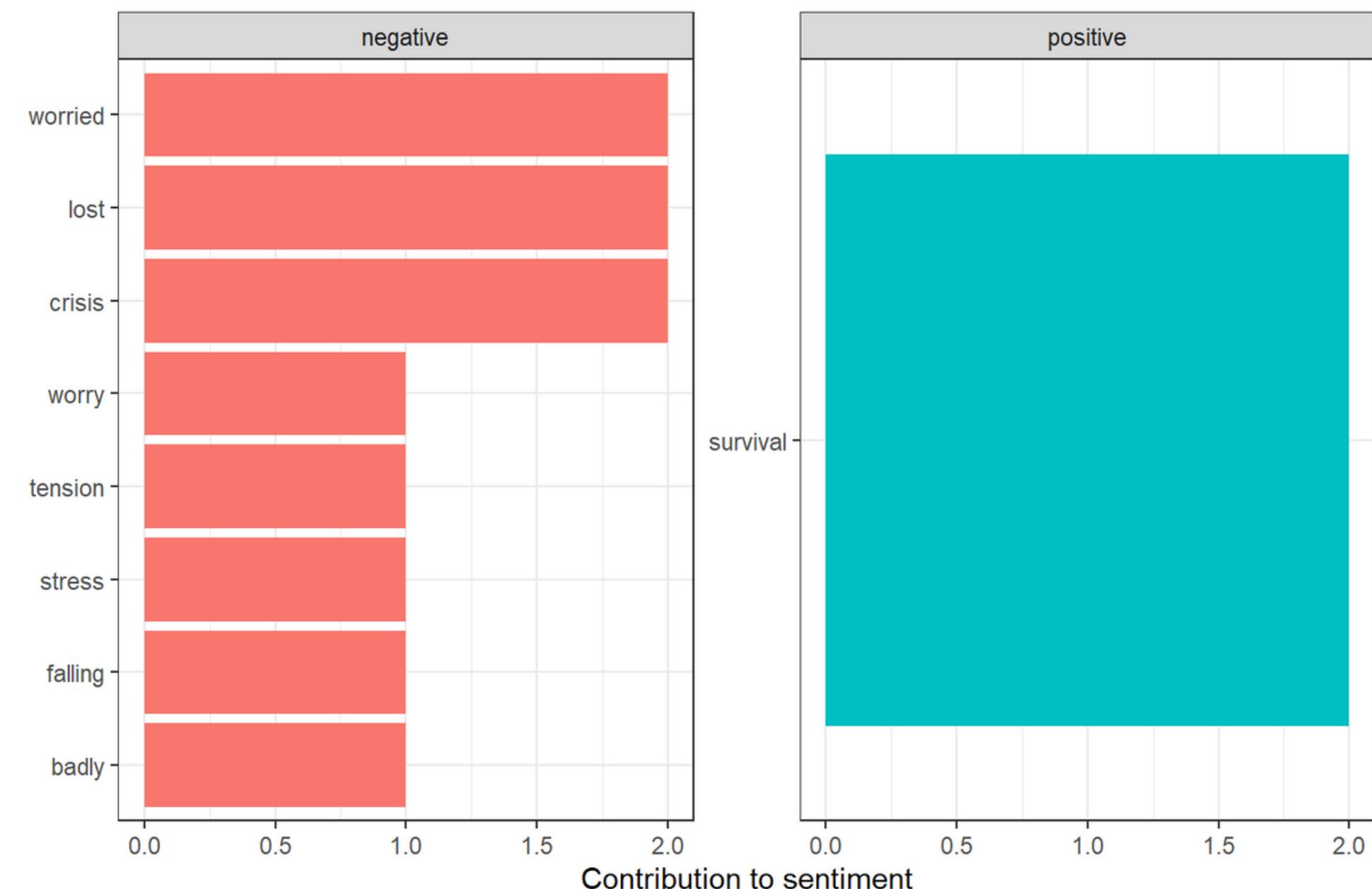


Word Cloud and Text Contribution

"FINANCIAL PROBLEMS"

survival
badly lost stress worried crisis falling
worry tension

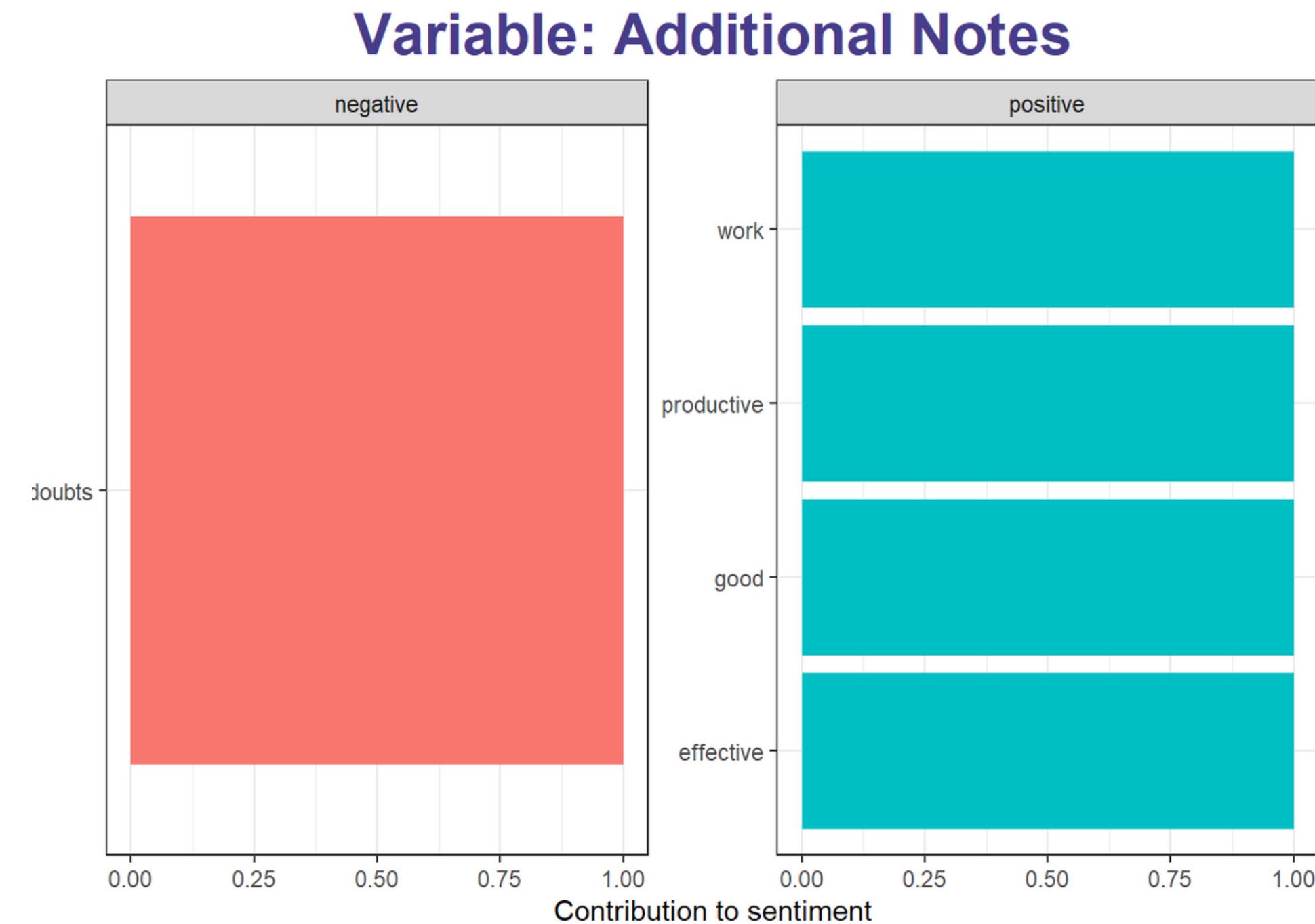
Variable: Financial Problems



Word Cloud and Text Contribution

" ADDITIONAL NOTES"

doubts
effective
good
productive
work



Sentiment by Word Aggregation

- The analysis shows that most of the words used throughout the questions had negative inclination.
- Only two variables had an overall positive sentiment, i.e. "motivation_reason" and "additional_notes".

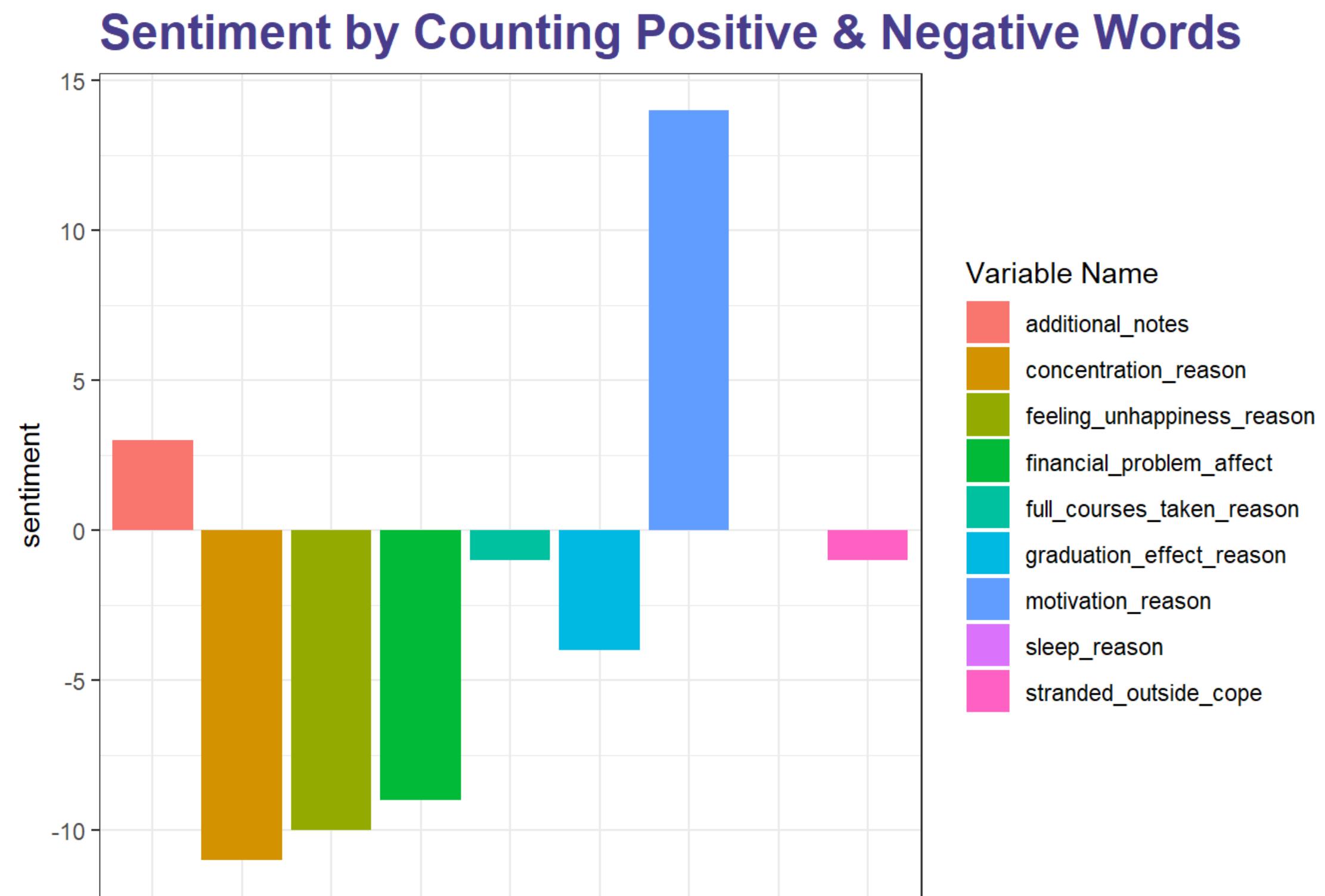


Figure 27

Conclusion

- One of the most important things we lacked was quantity of data. Our results are more promising with larger dataset.
- Overall, a Negative Sentiment is very prominent, leading us to conclude the negative effect on students' well being.
- We found that student's results were severely compromised when they were not able to study in Germany, when their graduation seem to get delayed and when/if they lose their job during COVID-19.

