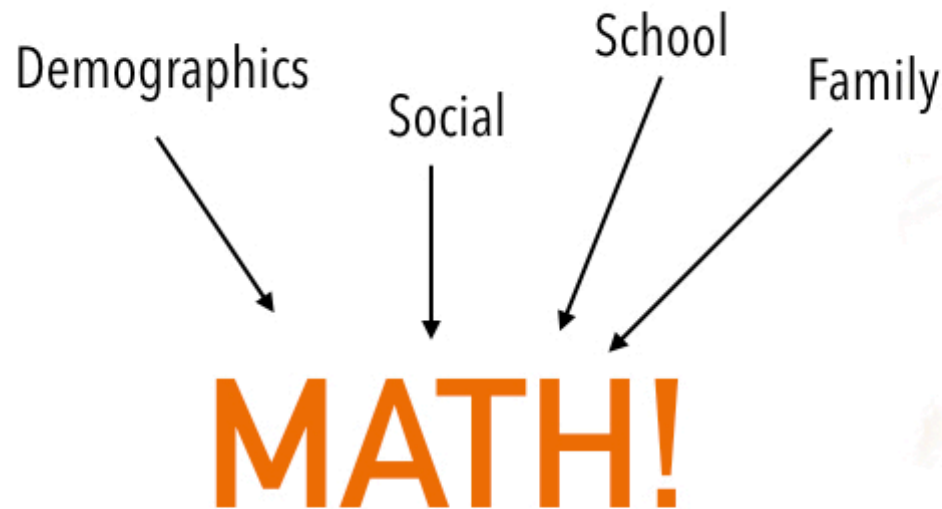# MATH IS FUN IF YOU ANALYZE IT RIGHT!

Hannah Wang, Jing Liu, Valentina Alvarez

OUR DATA SET

Student achievement in secondary education of two Portuguese schools

▷ November 2014
▷ School reports and questionnaires
▷ 395 observations and 33 variables

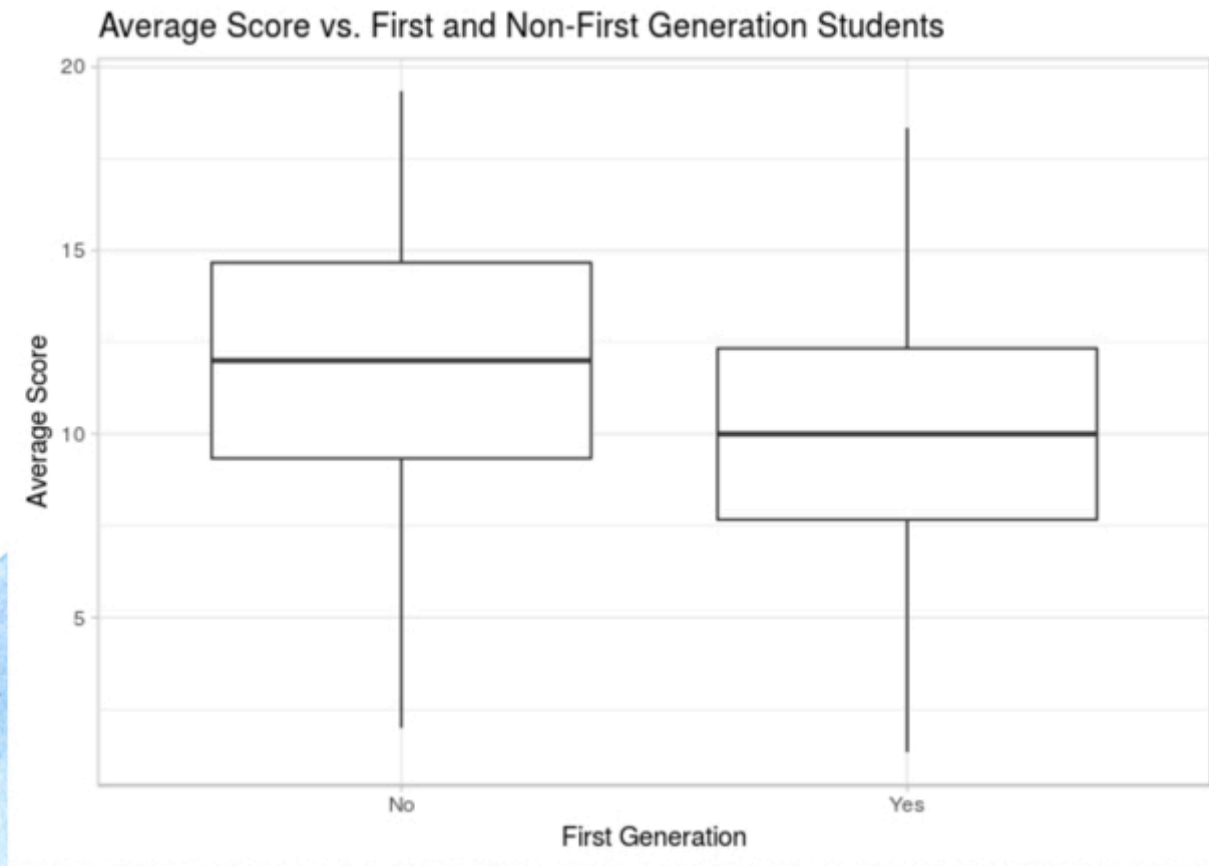Demographics   Social   School   Family

MATH!

Research Question:

Is there a statistically significant math score difference between first and non-first generation students? If so, we want to find out what are the variables that affect math scores in each group, in order to determine which factors we need to address to reduce the difference in math scores between first and non-first generation students.
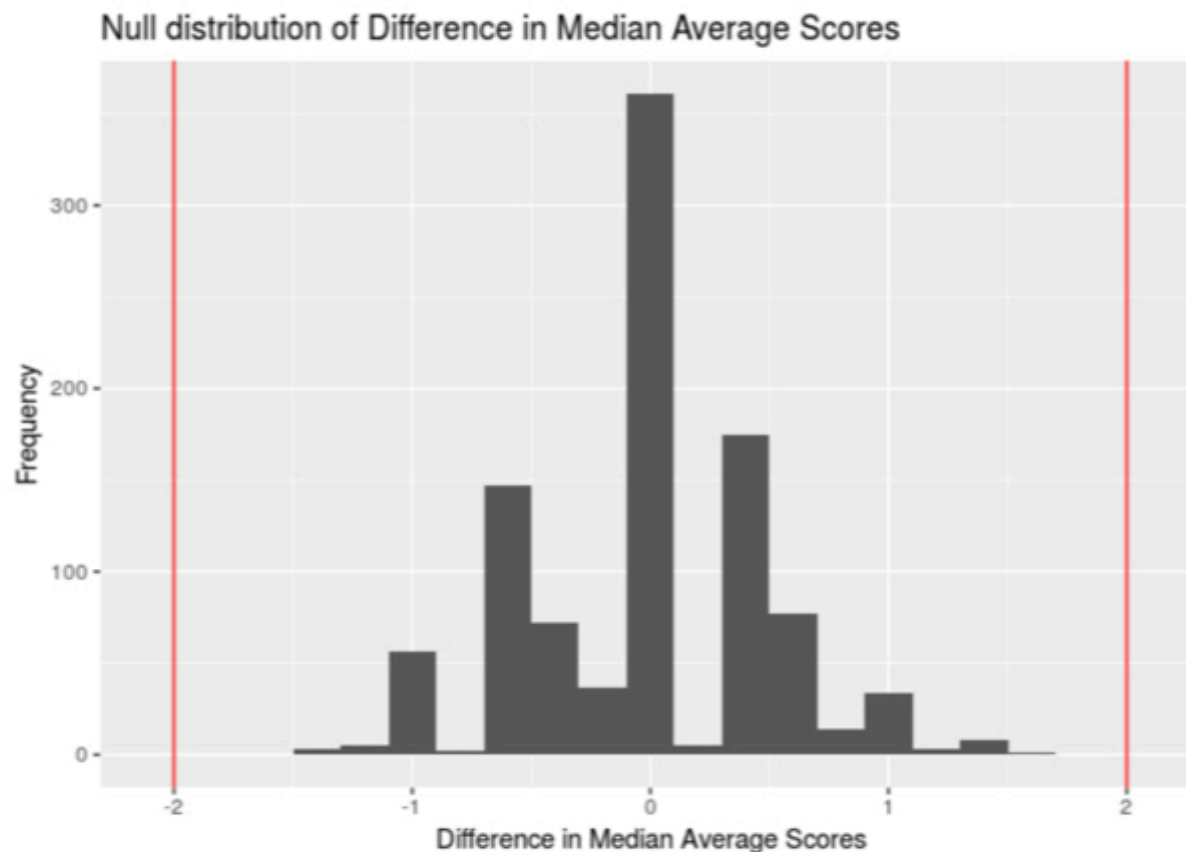
Is there a difference in grades between first and non-first generation students?

BOX PLOT:

Average Score vs. First and Non-First Generation Students

Is there a statistically significant difference in grades between first and non-first generation students?

BOOTSTRAP:

Null distribution of Difference in Median Average Scores

How certain are we of the difference between first and non-first generation students' grades?

CONFIDENCE INTERVAL (95%):

```
## # A tibble: 1 x 2
##    lower_bound upper_bound
##          <dbl>       <dbl>
## 1        -2.54       -1.06
```
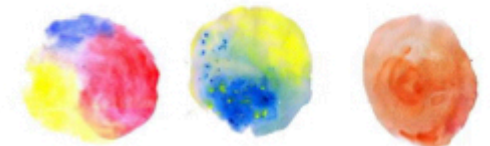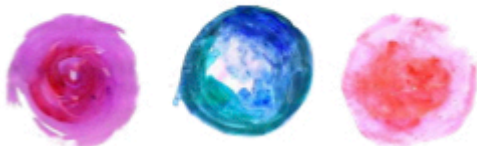
Which variables affect the math scores of each group?

FIRST GENERATION

- Past Class Failures
- Gender
- Study time
- Going out
- Address (urban or rural)
- Extra Curricular Activities
- Higher education
- Absences
- Workday alcohol consumption

NON-FIRST GENERATION

- Past Class Failures
- Mother's job
- Father's job
- Pursuing higher education
- School
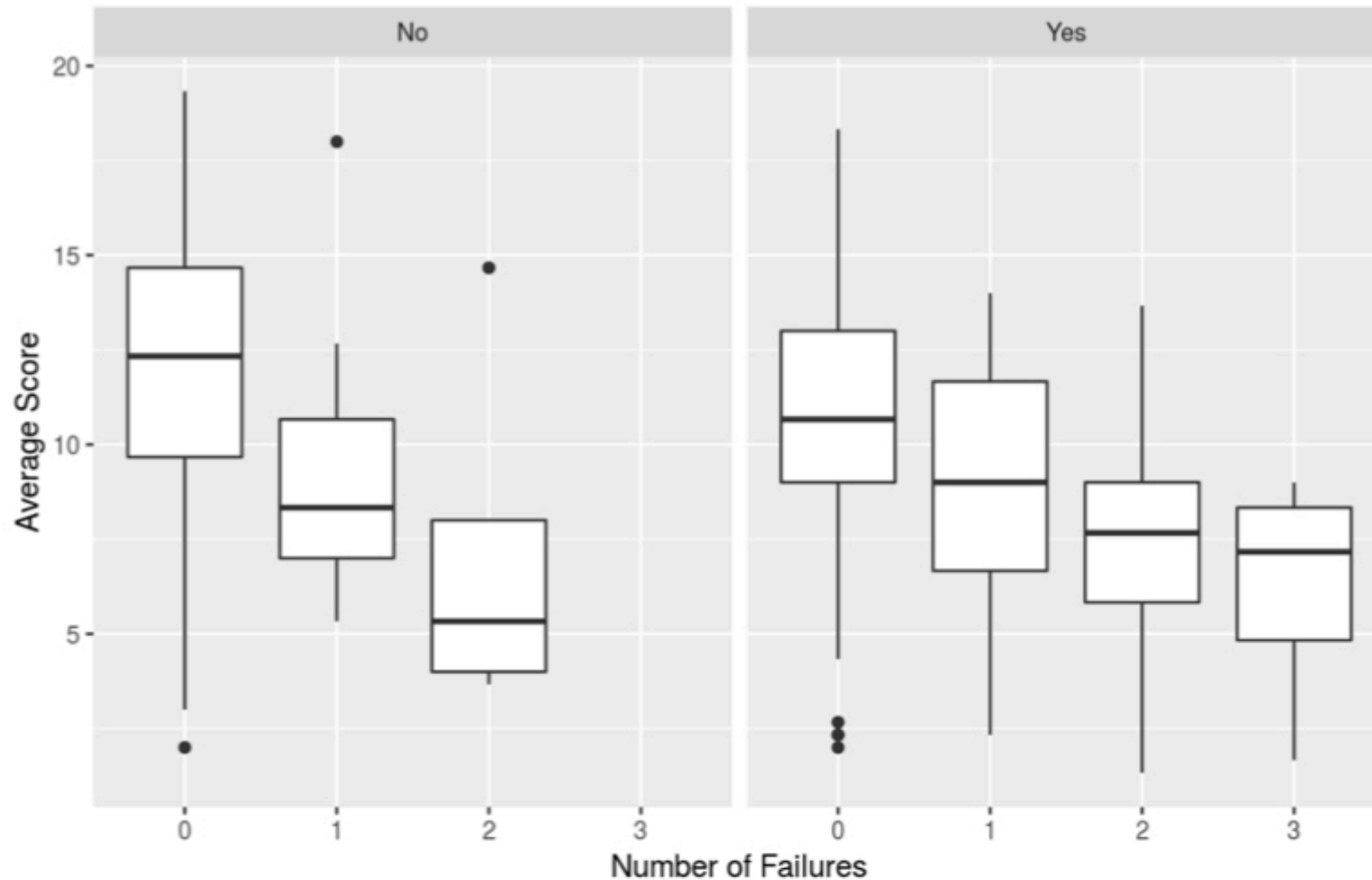- Workday alcohol consumption
- Internet access
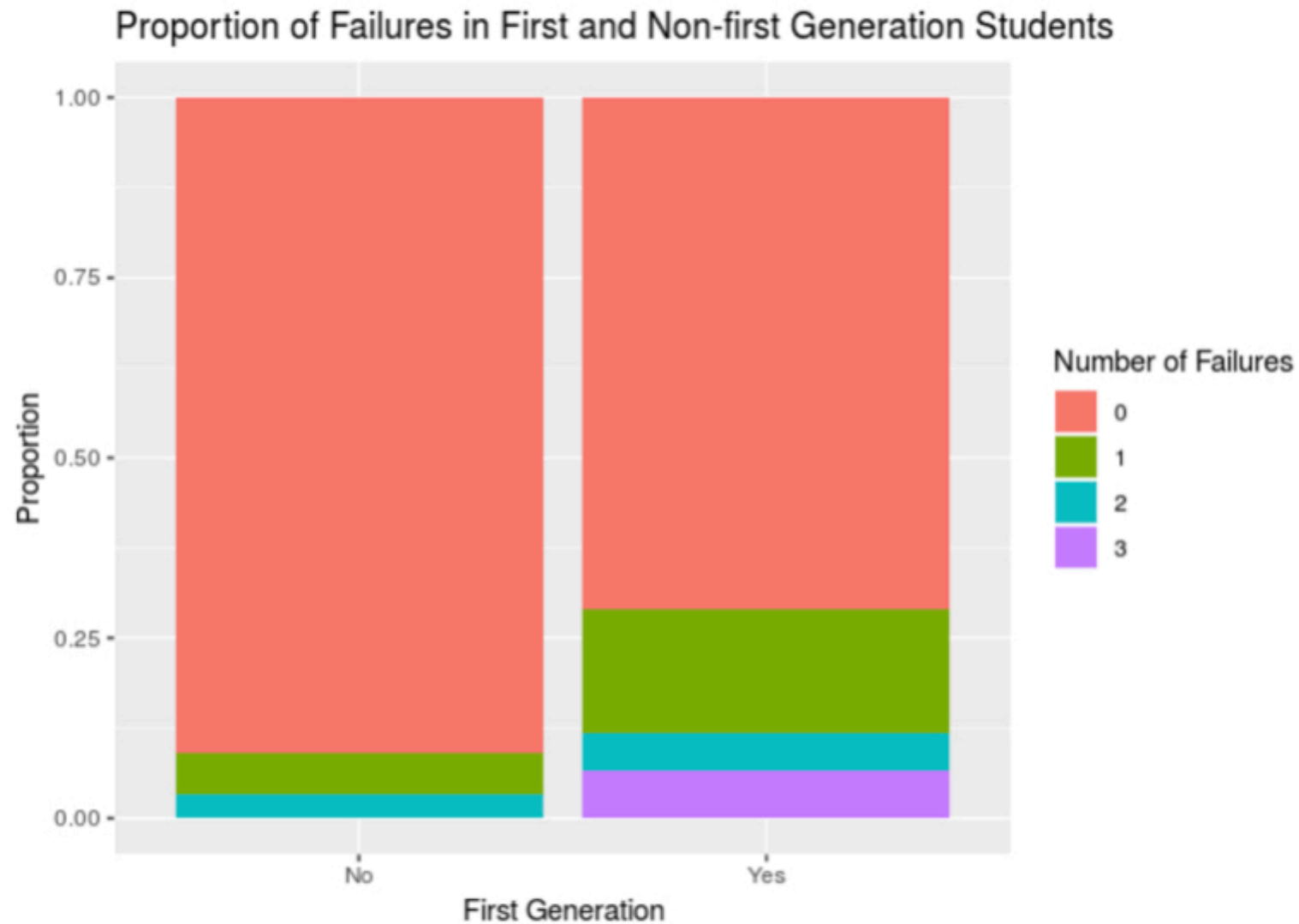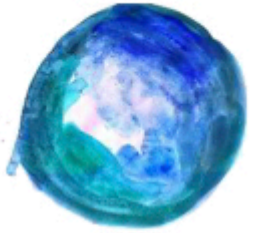- Travel time

SHINY
APP

FAILURES

Relationship Between Average Scores and Numbers of Past Failures
First Generation vs. Non-first Generation Students

FAILURES

Proportion of Failures in First and Non-first Generation Students
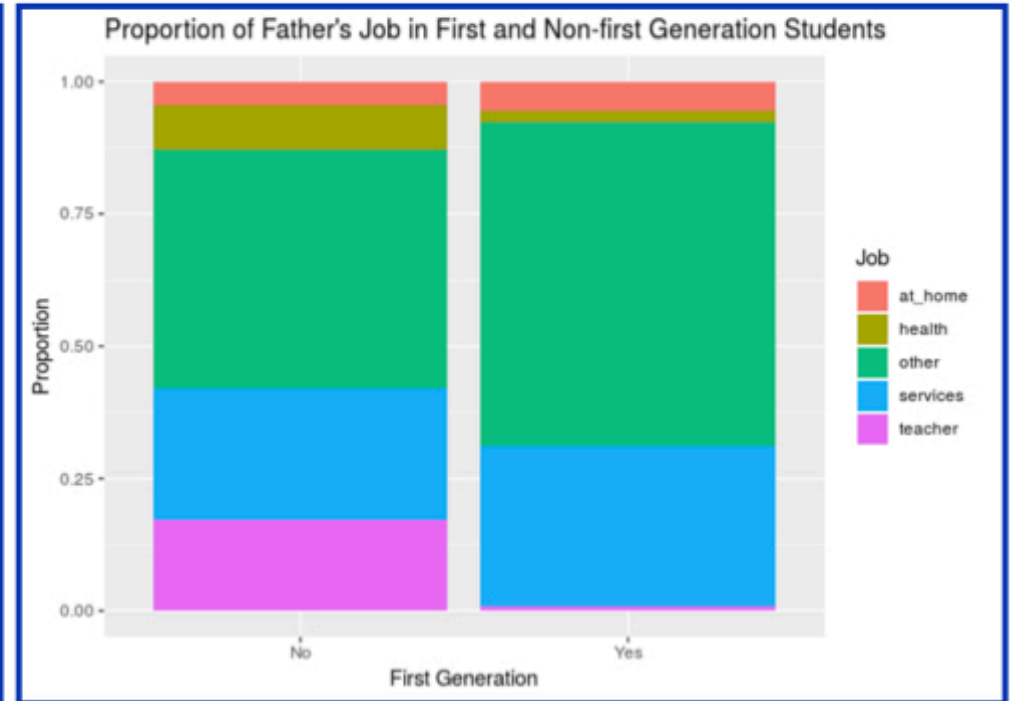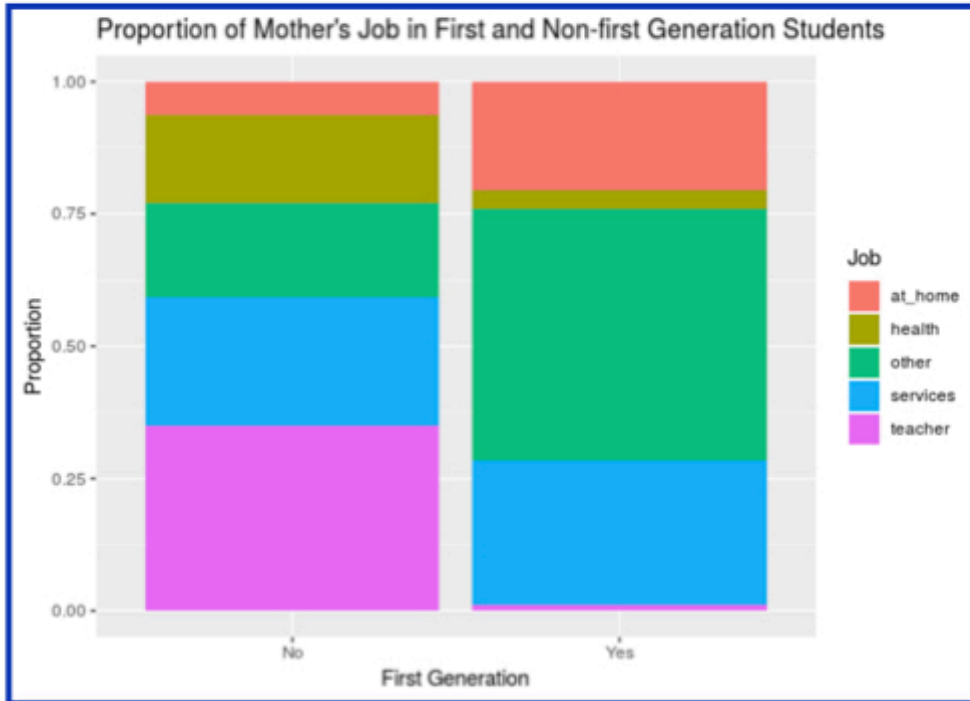
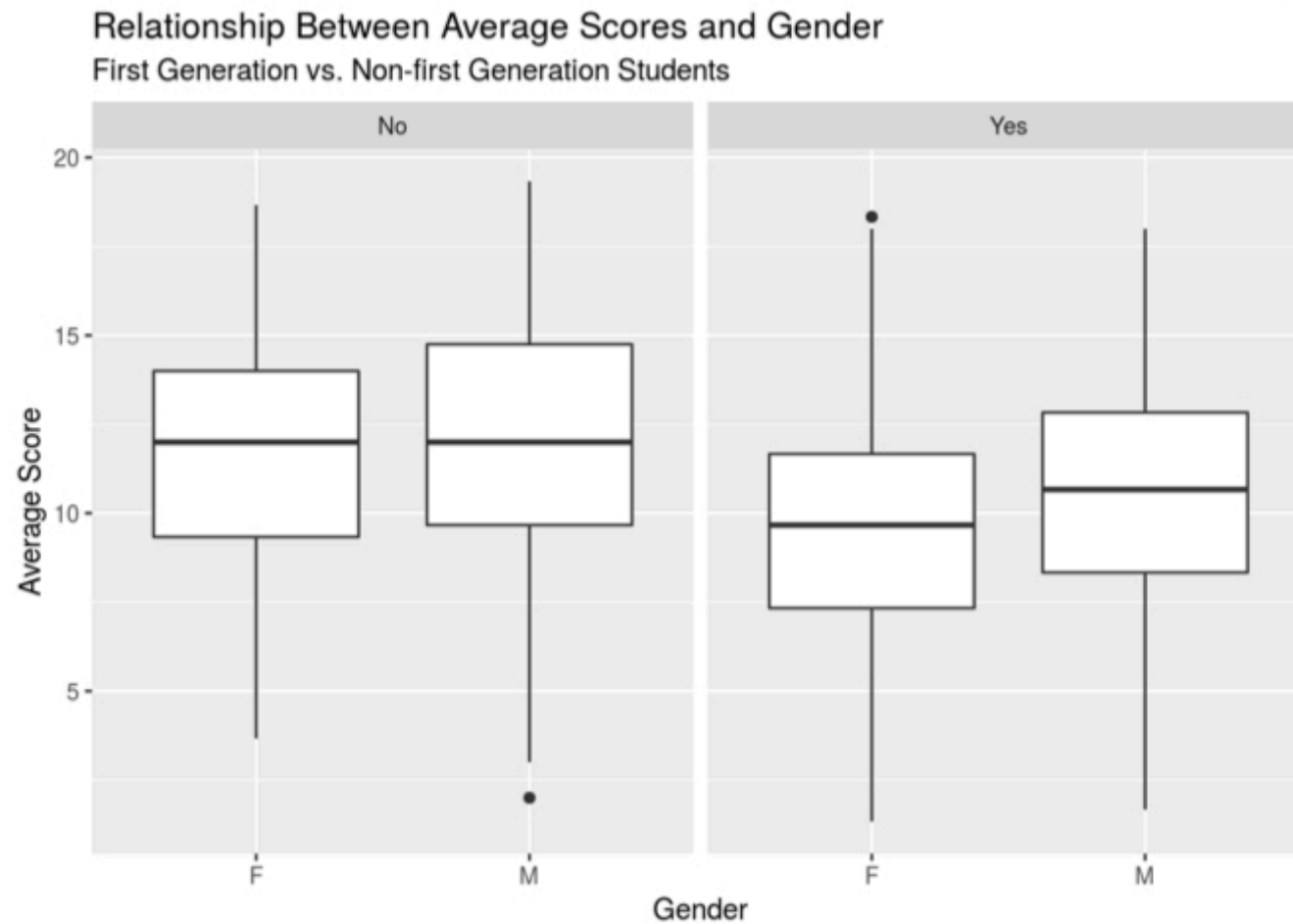# PARENTS' JOBS

1. Non-first generation students: Parents as "Teachers"
2. Non-first generation students: Mothers in healthcare

GENDER

Relationship Between Average Scores and Gender
First Generation vs. Non-first Generation Students

CAN WE TRUST THE DATA SET?

Sample size

Data collection

- Study time

FURTHER RESEARCH...

1. Failures

2. Parent's jobs

3. Gender

4. Going out