

**MATH IS FUN IF YOU
ANALYZE IT RIGHT!**

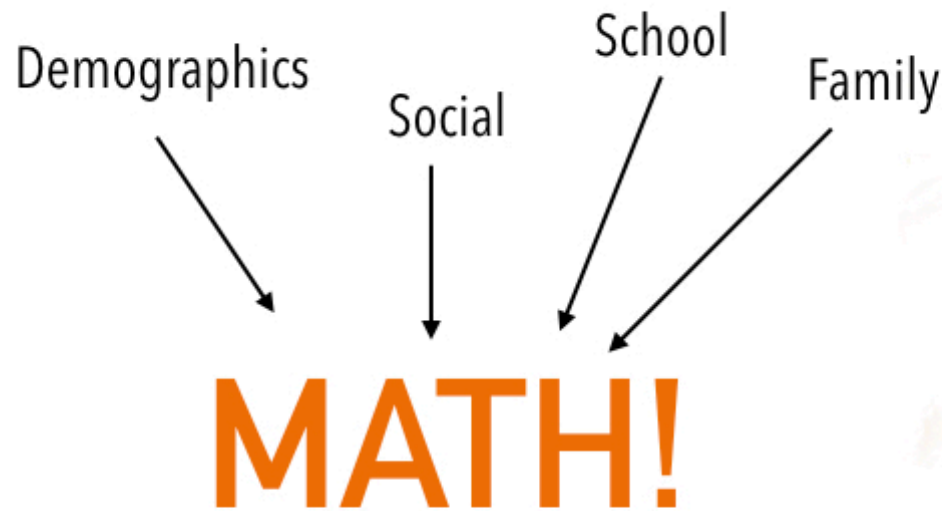
Hannah Wang, Jing Liu, Valentina Alvarez

OUR DATA SET



Student achievement in secondary education of two Portuguese schools

- ▶ November 2014
- ▶ School reports and questionnaires
- ▶ 395 observations and 33 variables



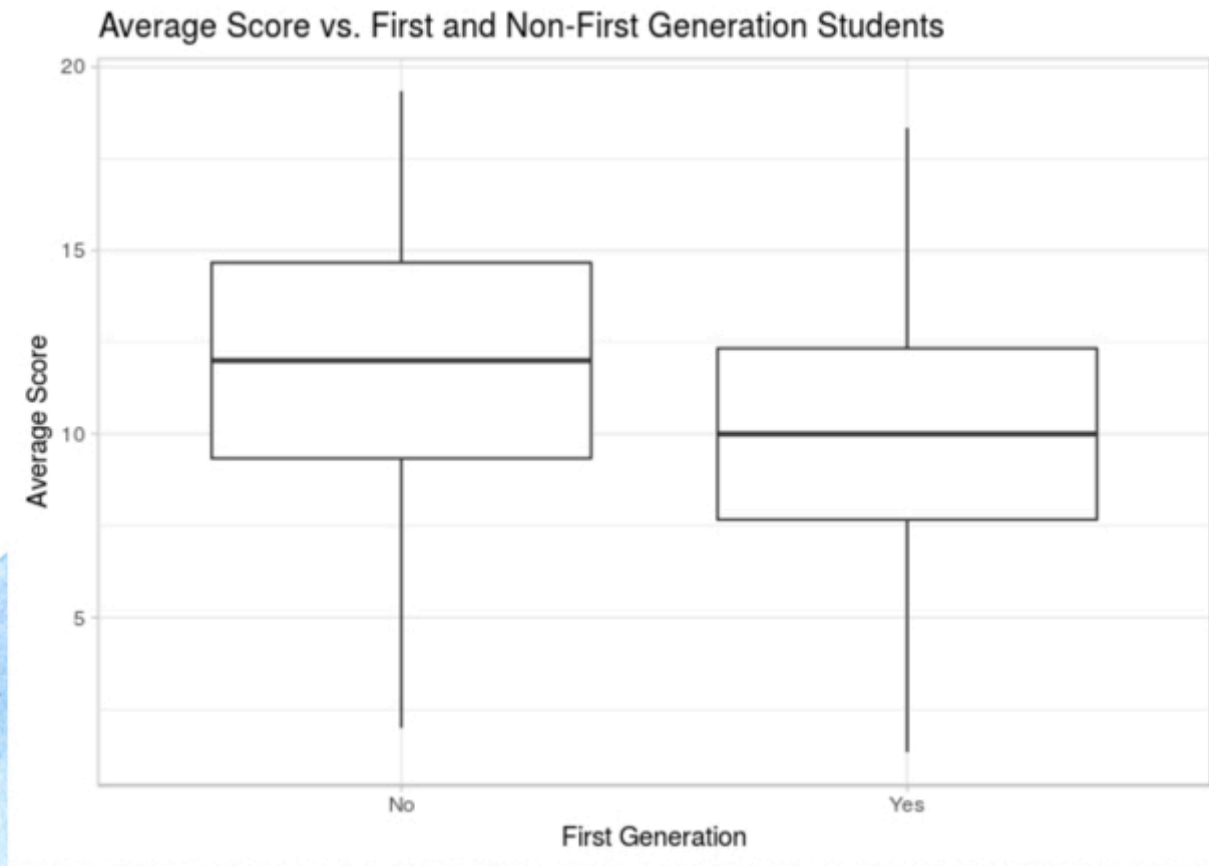


Research Question:

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.

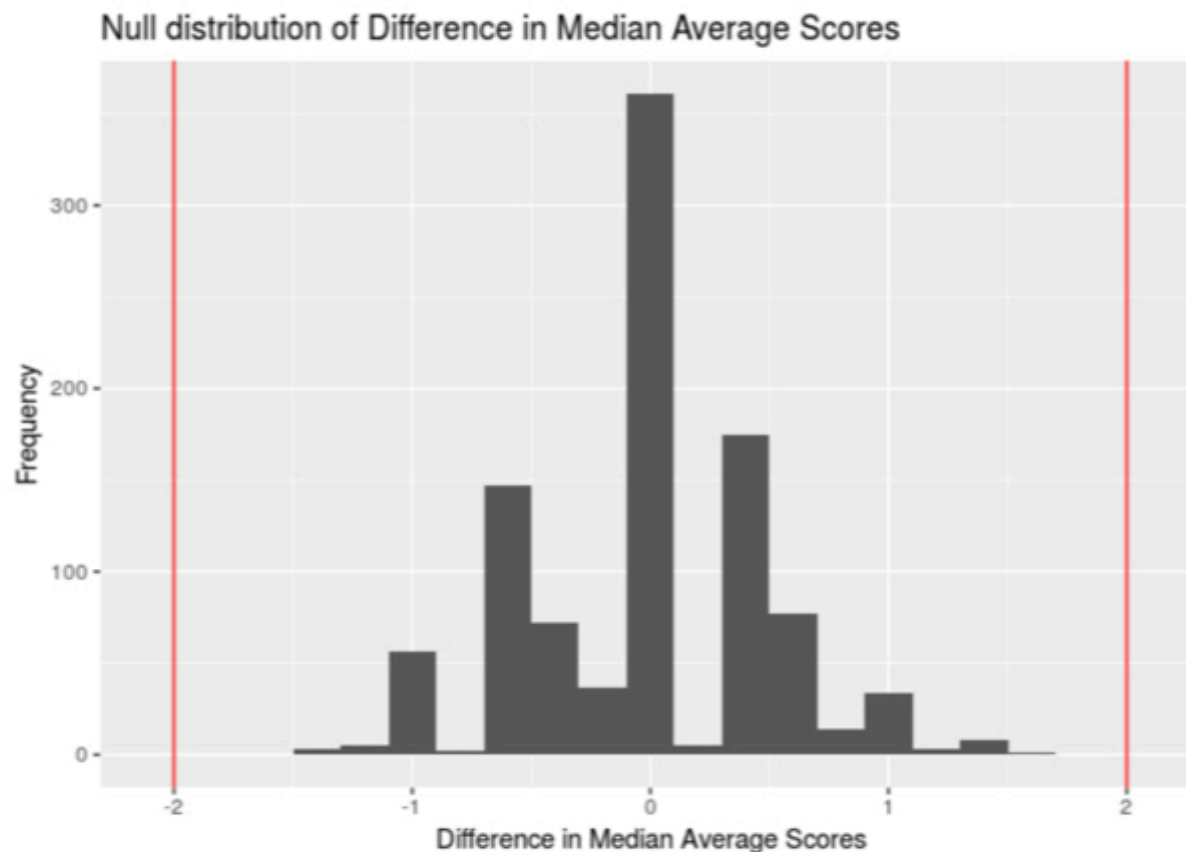
Is there a difference in grades between first and non-first generation students?

BOX PLOT:



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

BOOTSTRAP:



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
```

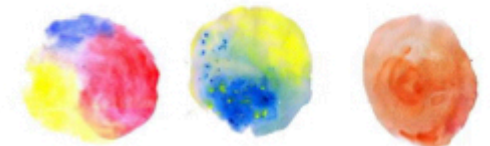
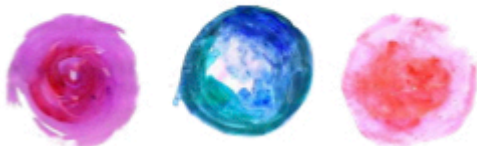
Which variables affect the math scores of each group?

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



A circular watercolor splash in shades of orange, red, and pink, centered on a white background. The splash has a textured, painterly appearance with varying intensities of color.

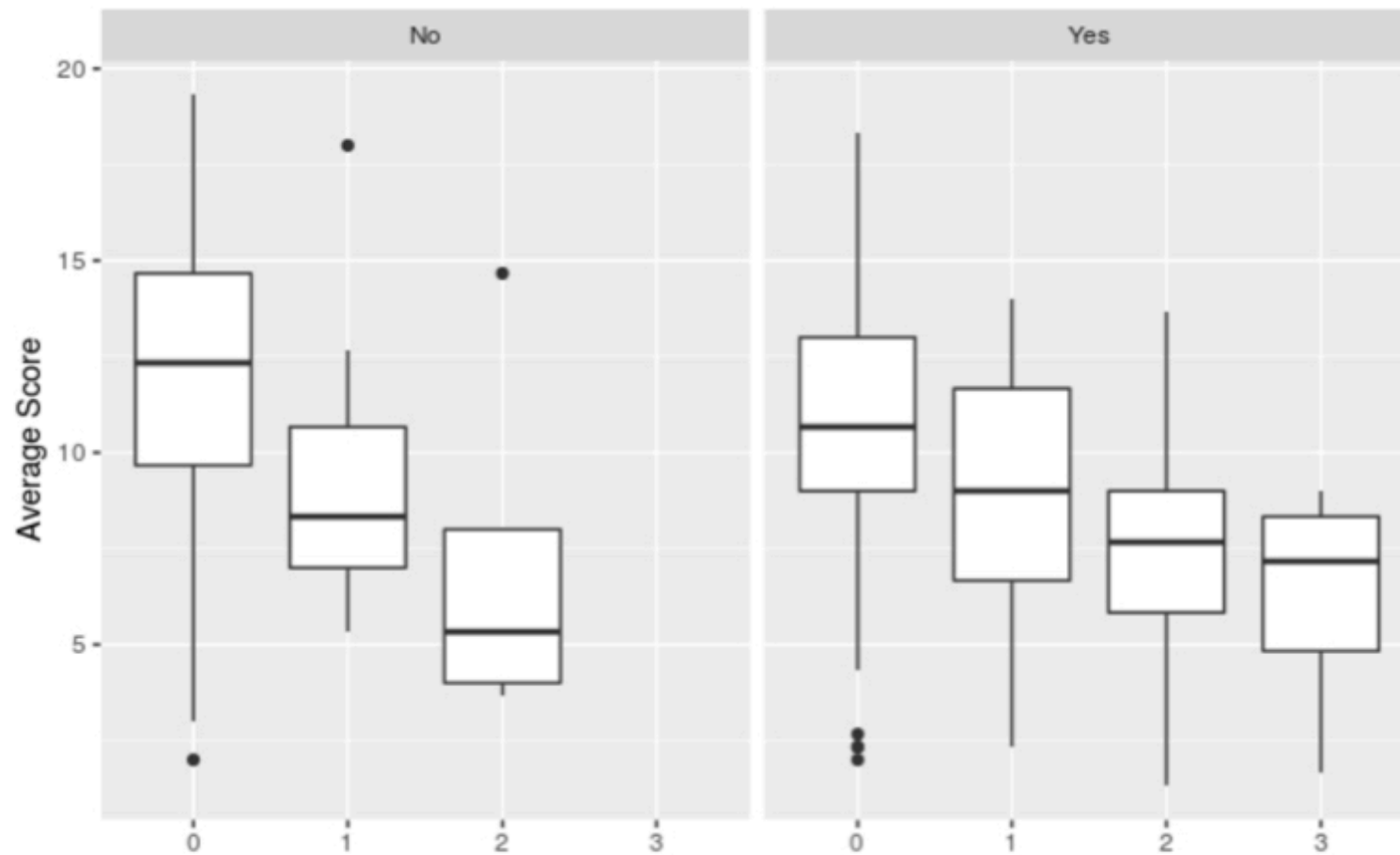
**SHINY
APP**



FAILURES

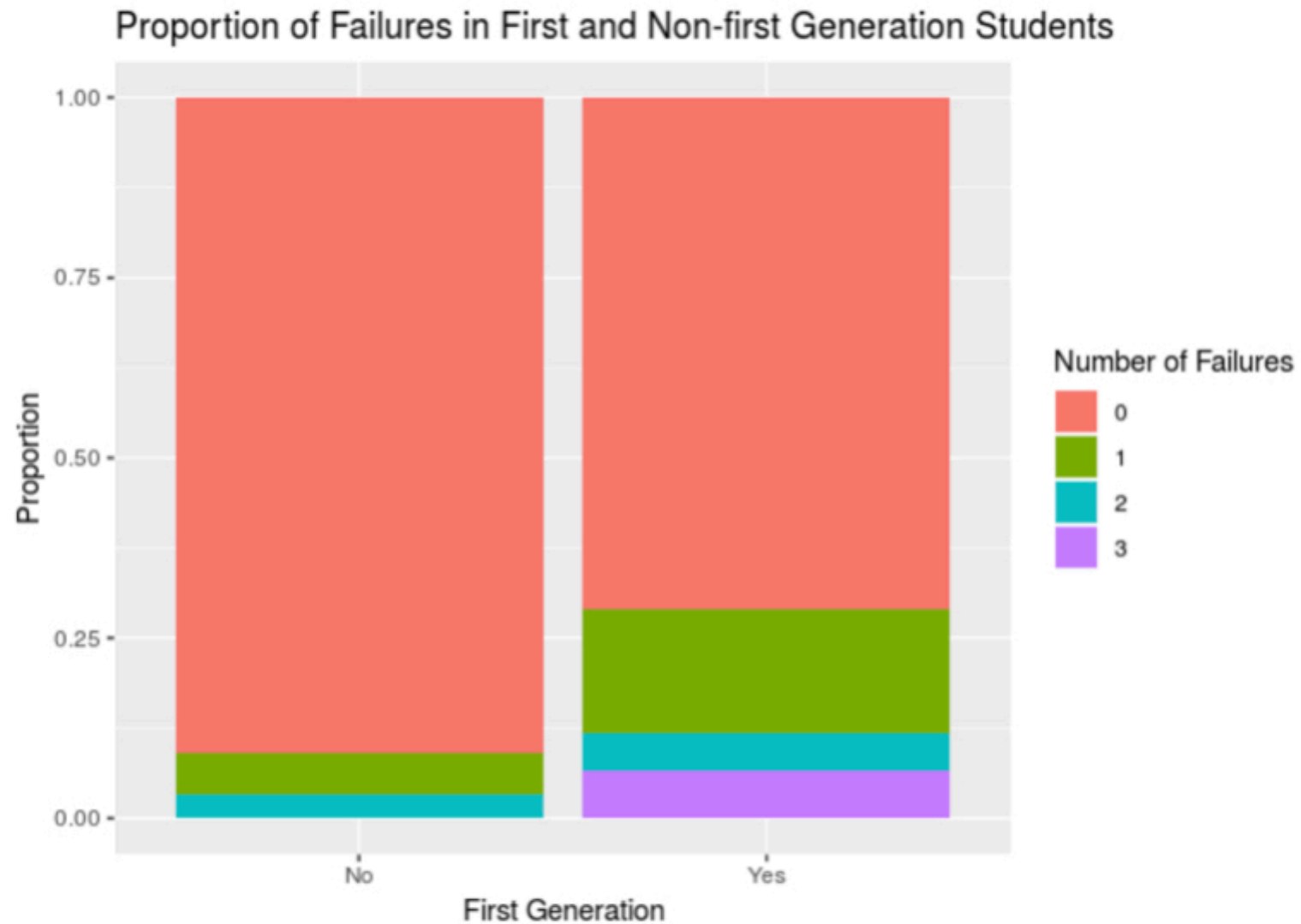
Relationship Between Average Scores and Numbers of Past Failures

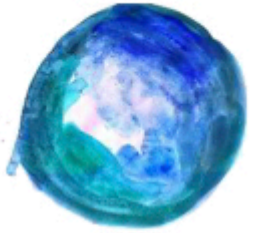
First Generation vs. Non-first Generation



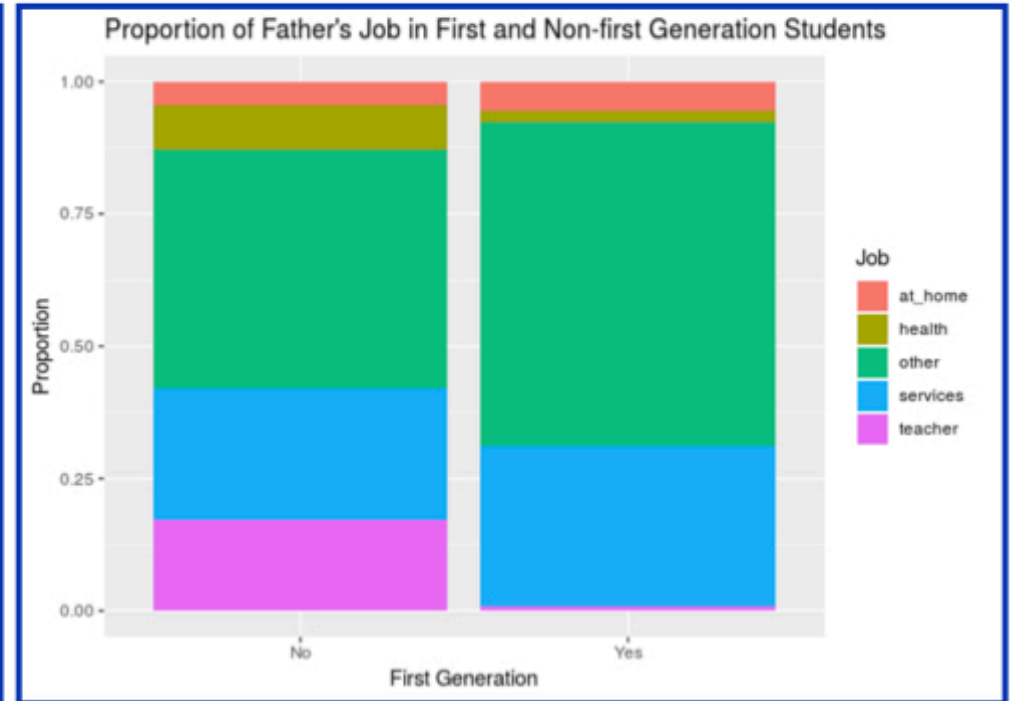
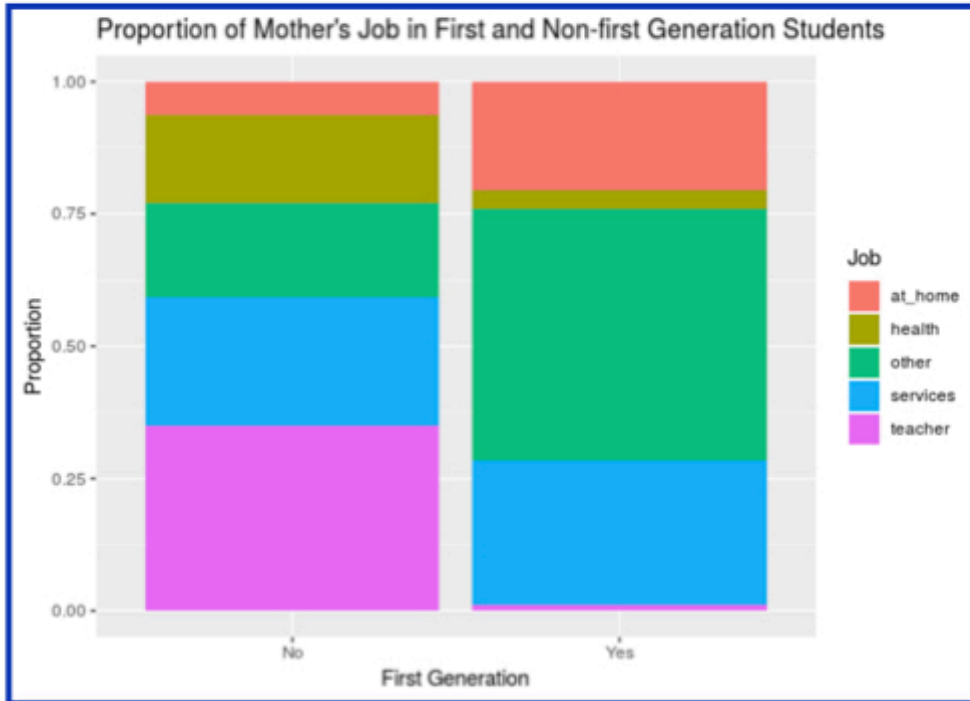


FAILURES





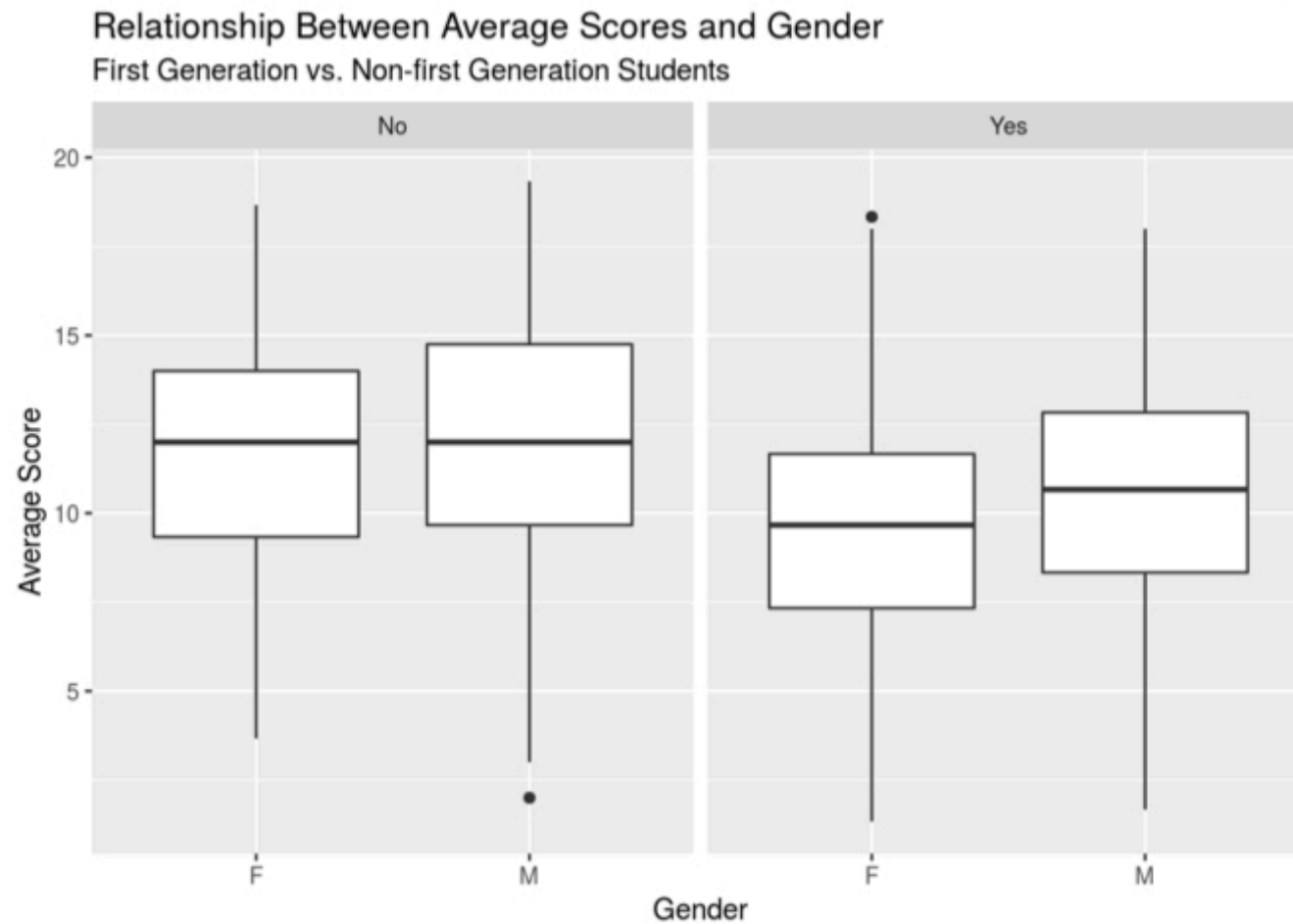
PARENTS' JOBS



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



GENDER



CAN WE TRUST THE DATA SET?



A diagram illustrating factors that affect the trustworthiness of a data set. At the top, the question 'CAN WE TRUST THE DATA SET?' is written in large, bold, blue letters. Two blue lines point downwards from this question to two separate blue ink splatters. The left splatter contains the text 'Sample size'. The right splatter contains the text 'Data collection' and a bulleted list item '- Study time'.

**Sample
size**

**Data
collection**

- Study time



FURTHER RESEARCH...

1. Failures

2. Parent's jobs

3. Gender

4. Going out