Assignment 4

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Contents

Set Up & Introduction

The Data

- For this assignment, I will be analyzing data from the barroso2021 data set. This data set is from the psymetadata package, and it observes the relationship between math achievement and math anxiety (https://psycnet.apa.org/record/2020-80018-001)
- These Variables Will Be The Focus of This Assignment:
  - Grade: participants included were in grades 1 through 6
  - Math Ability: categorized by low or not low
  - Effect Size: where the absolute value was calculated, so values range from 0 (no effect) to 1 (strongest possible effect)

Sample Size By Grade

Grade 5 has the biggest sample, as well as students for both high and low math ability conditions. Grade 6 has the lowest sample size, which likely explains the lack of samples for students with low math abilities. The absence/presence of low math ability students in the other grades is not well understood at this time. This will likely play a role in observations of effect size.

```
## # A tibble: 6 x 2
##   grade     n
##   <int> <int>
## 1     1    68
## 2     2    89
## 3     3   116
## 4     4    99
```

```
## 5      5   355
## 6      6    20
```

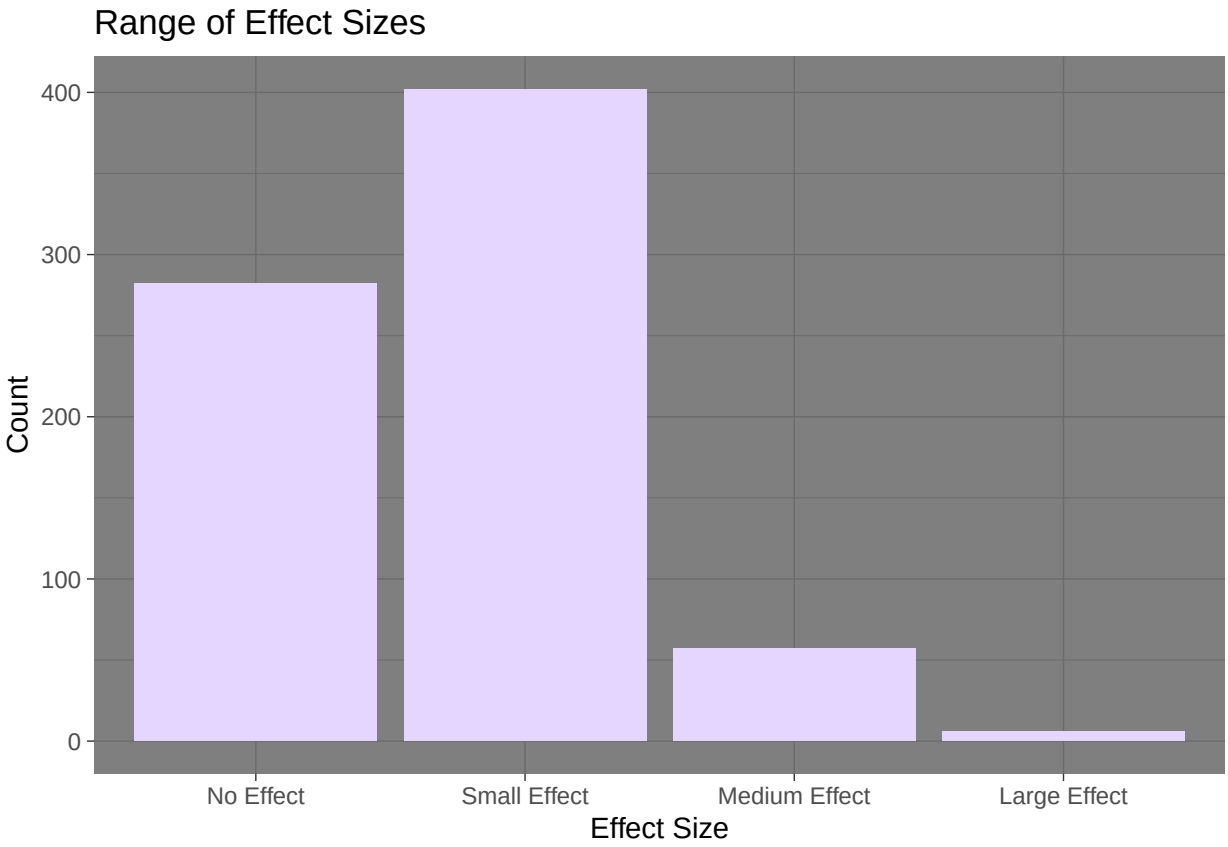
Note: only groups 2 and 5 have students in the low math ability condition

Range of Effect Size Values

Effect sizes are organized on a scale from "no effect" to "large effect":

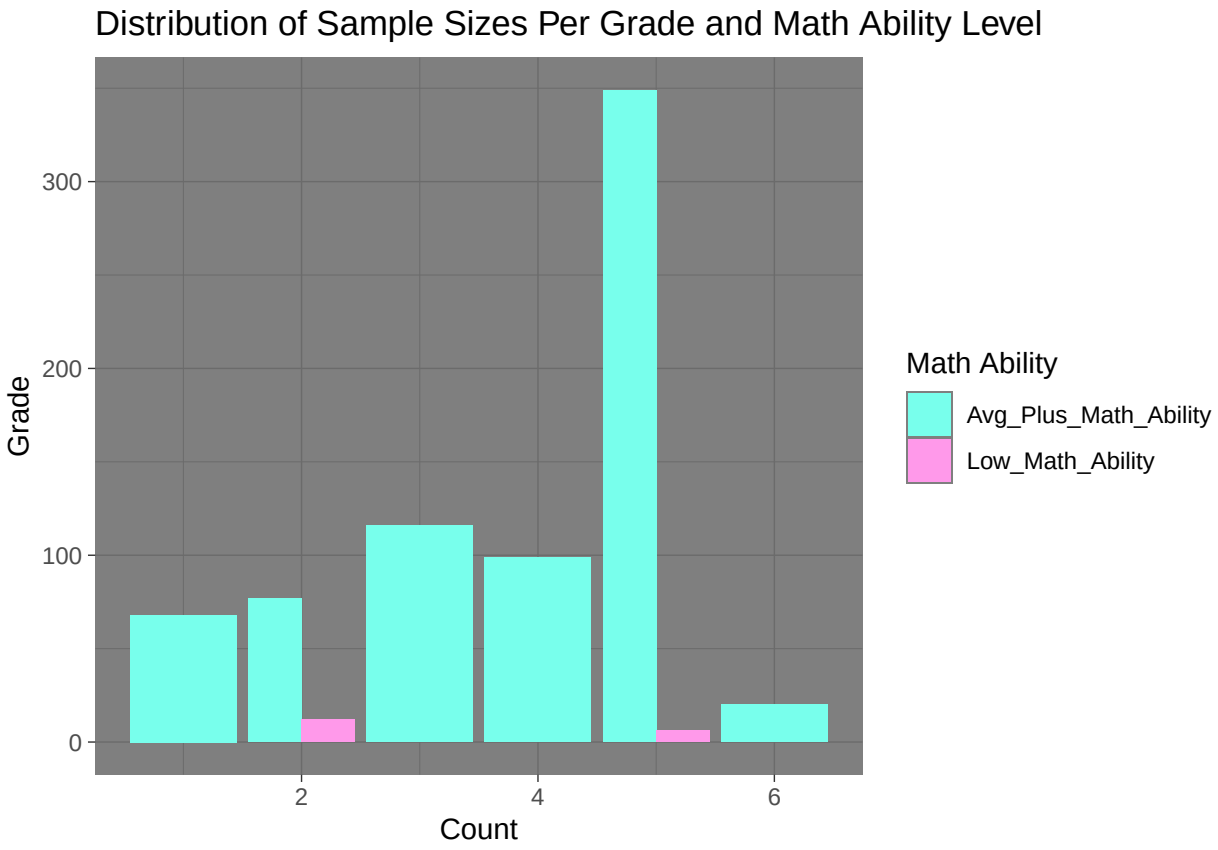
- No effect: 0.0 until 0.2
- Small effect: 0.2 until 0.5
- Medium effect: 0.5 until 0.8
- Large effect: 0.8 and above

Effect Size Distribution

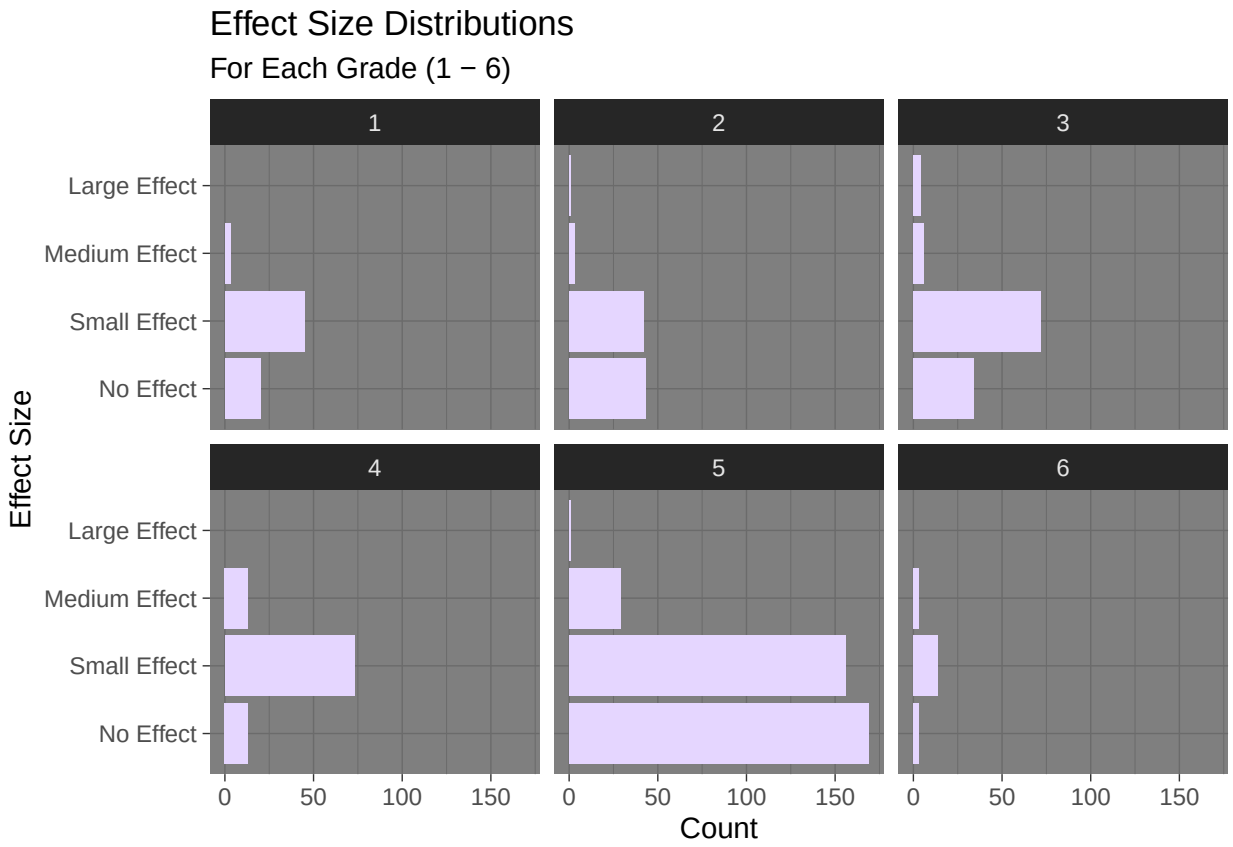


Visualizations & Analysis

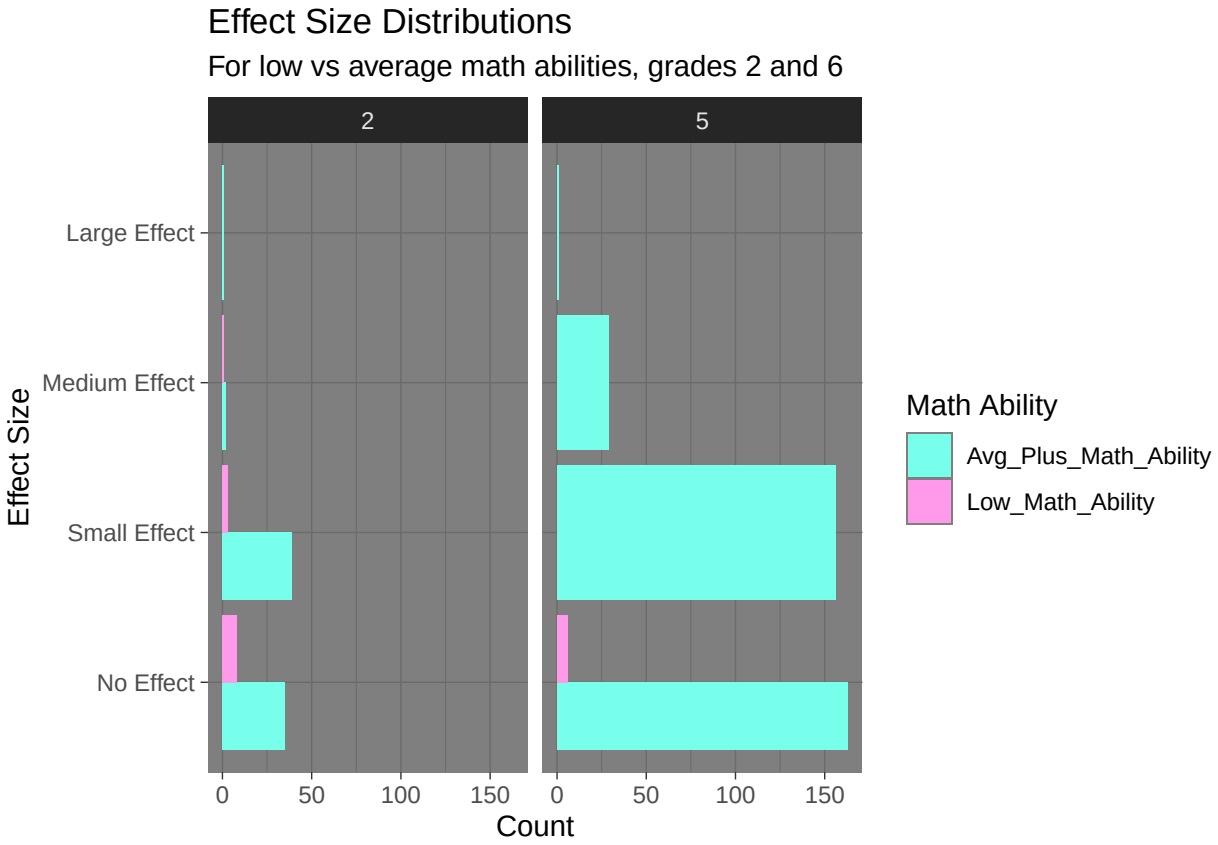
Sample Size - Grouped by Grade and Math Ability



Effect Size Distributed By Grade



Low vs Other Math Ability - Grades 2 and 5



Conclusion

There is a significantly smaller effect size for low math ability participants compared to average-above average students. This is likely impacted by the small sample sizes in these conditions. There is a less obvious (but still important) difference in effect sizes for each grade. Grade 5 has the highest number of scores for each effect size condition except "large effect". This is likely due to its significantly higher sample size than that of the other grades.