

# How left are mathematicians?

by Samuel Olatunde, Bryce Koch, Dr. Joel Schmitter

# Outline

- Introduction
- Rationale
- Procedure
- Challenges
- Data
- Interpretation
- Conclusion

# What did we do?

We investigated whether mathematics departments in the U.S. have a higher proportion of left-handed individuals compared to the general American population.

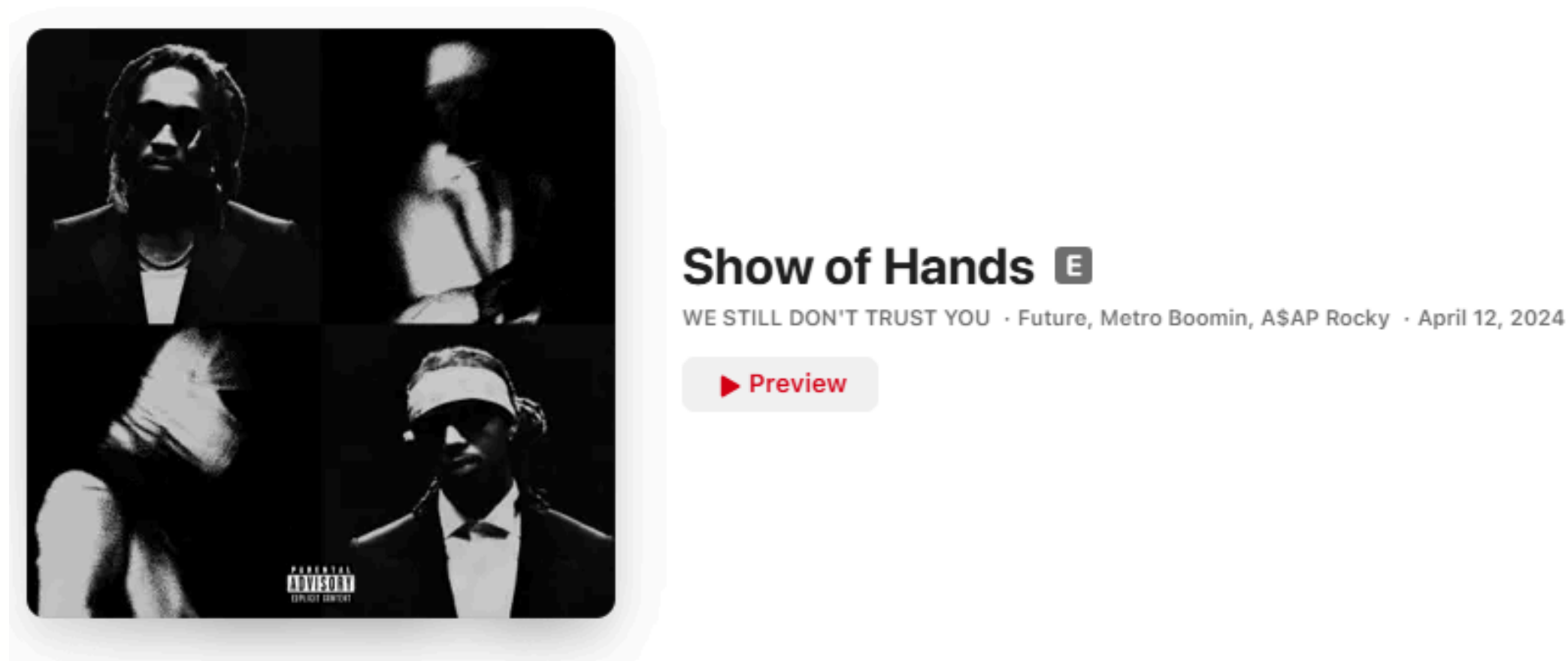
# Why Did we Do it?

- Rare occurrence: 4 of 6 stats students were left-handed

$$P(x \geq 4) = 0.176\%$$

- Sparked Curiosity: Is this a trend in mathematics?

## Let's put this to the test!



# How did we do it?

- **Step 1:** Randomly selected 40 math-offering universities using ChatGPT
- **Step 2:** Web-scraped email addresses of math department contacts
- **Step 3:** Sent participation request for a headcount of math majors and faculty
- **Step 4:** Collected and Analyzed the data

# Speedbumps

## Step 3: Participation Request

- IRB approval required due to involvement with human subjects
- To obtain IRB approval:
  - Completed a 9-module course on Responsible Conduct of Research in Physical Science
  - Developed a script to be read to participants before the head count, explaining the process and consent

## Step 4: Data Analysis

- Limited Responses, (5/ 40) over a 5 month span

# Hypothesis

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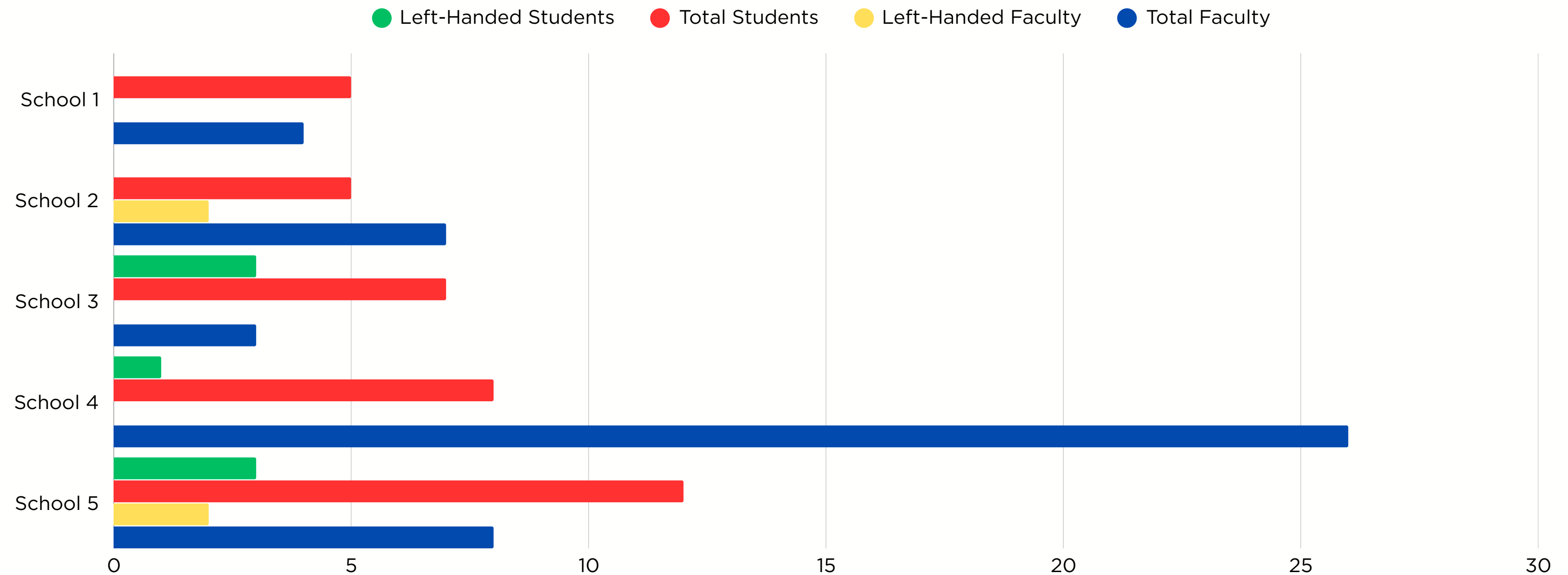
$H_0$ : Proportion of left-handed mathematicians  $\leq$  the general population

$H_1$ : Proportion of left-handed mathematicians  $>$  the general population

The proportion of left-handedness in the  
general population will be defined as 10.9%  
within this study

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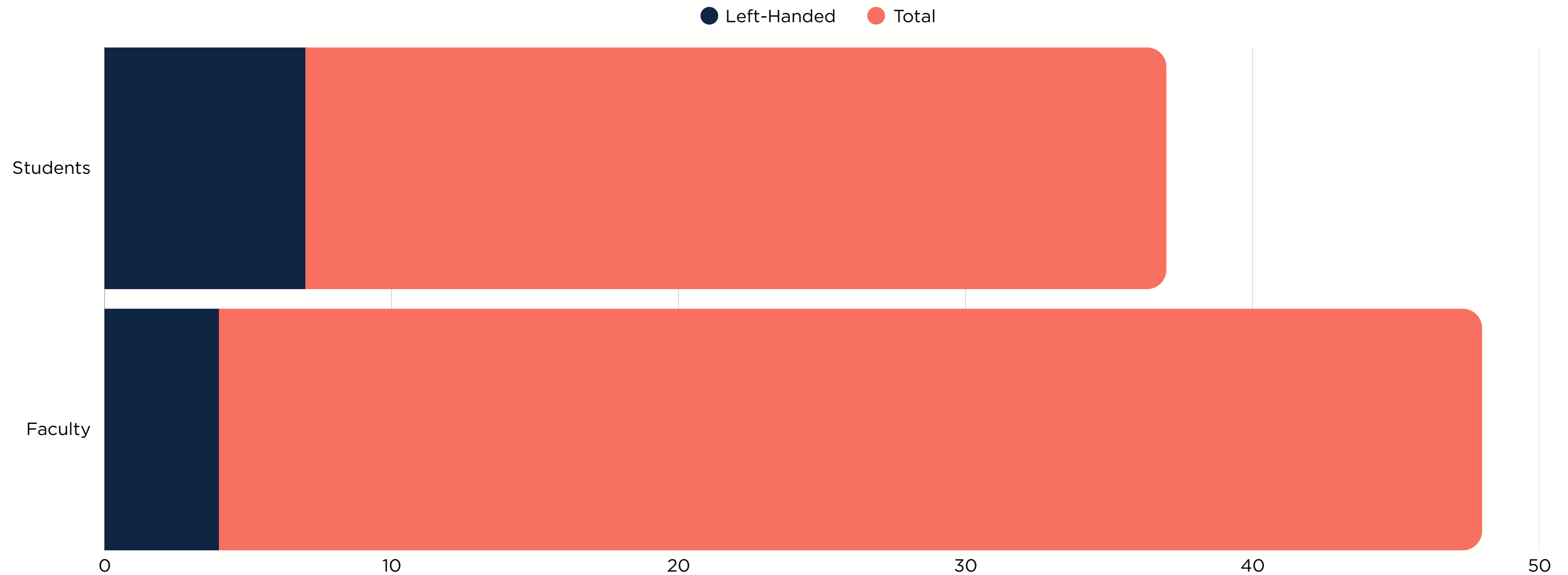
# Data Collected





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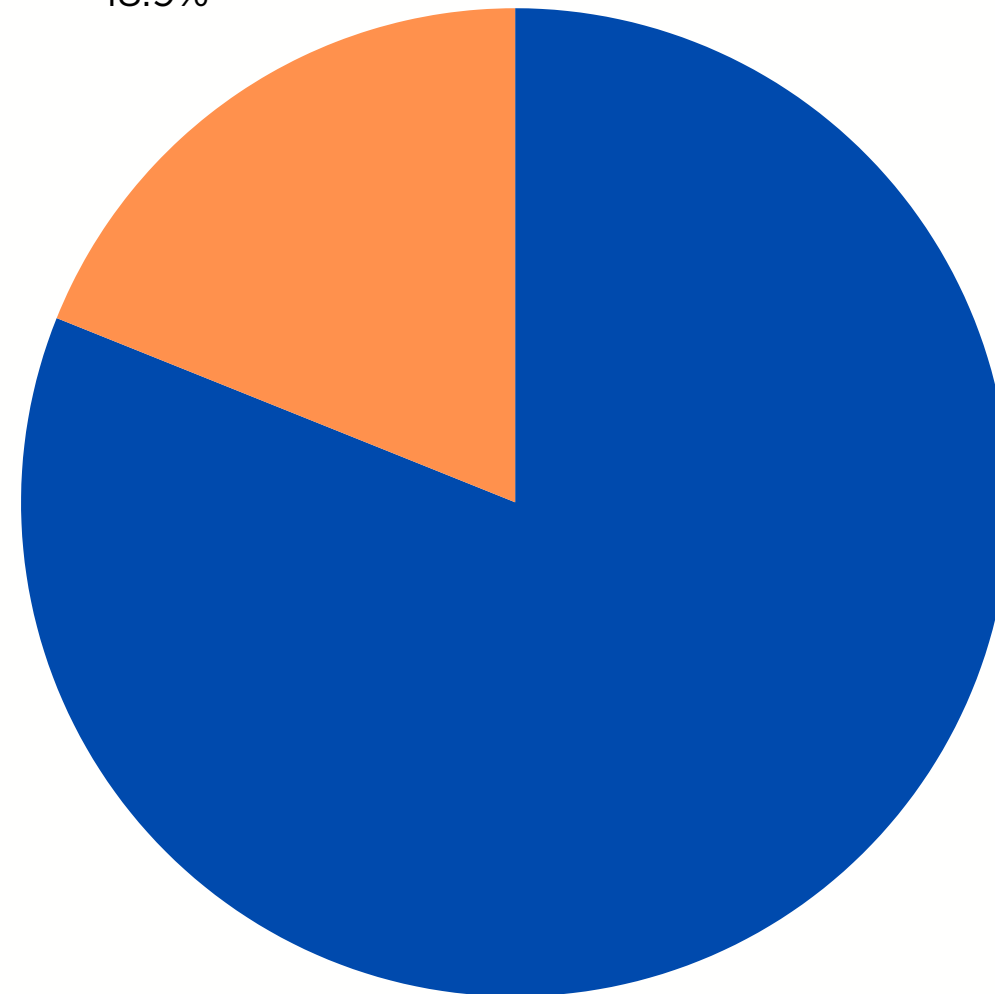
# Data Collected



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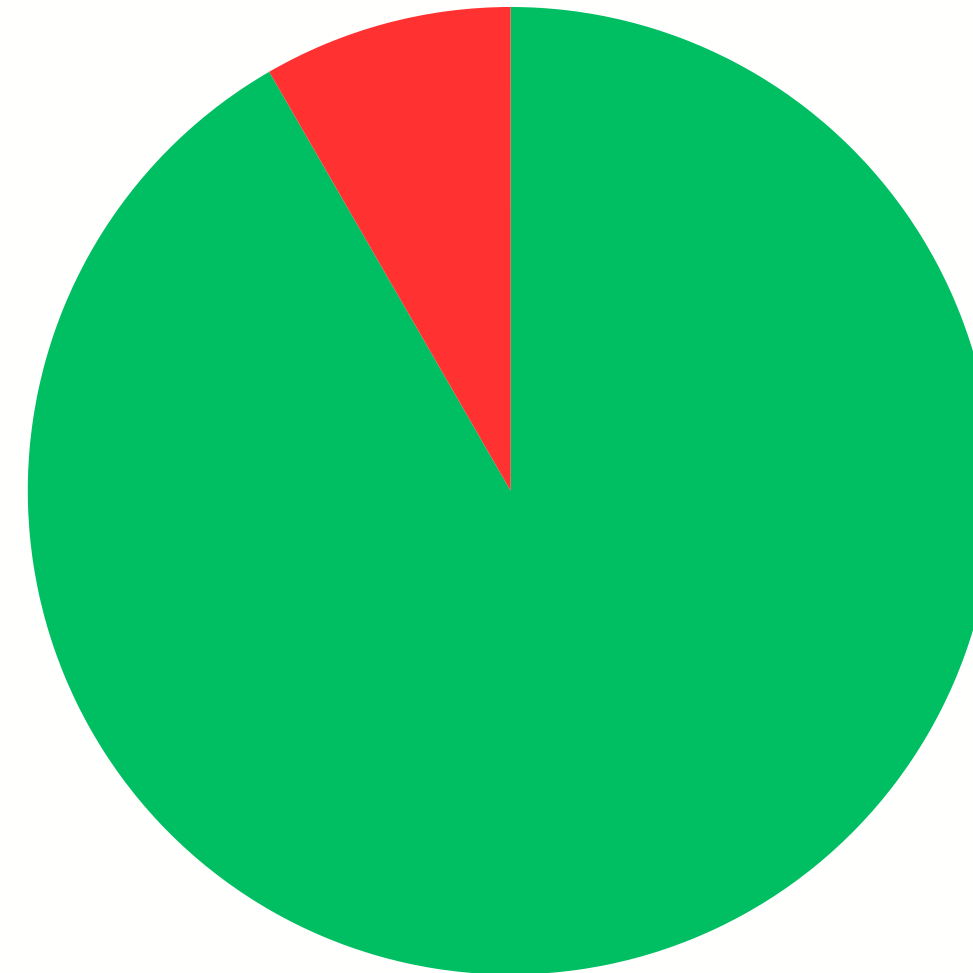
# Results

Left-Handed Students  
18.9%



Right-Handed Students  
81.1%

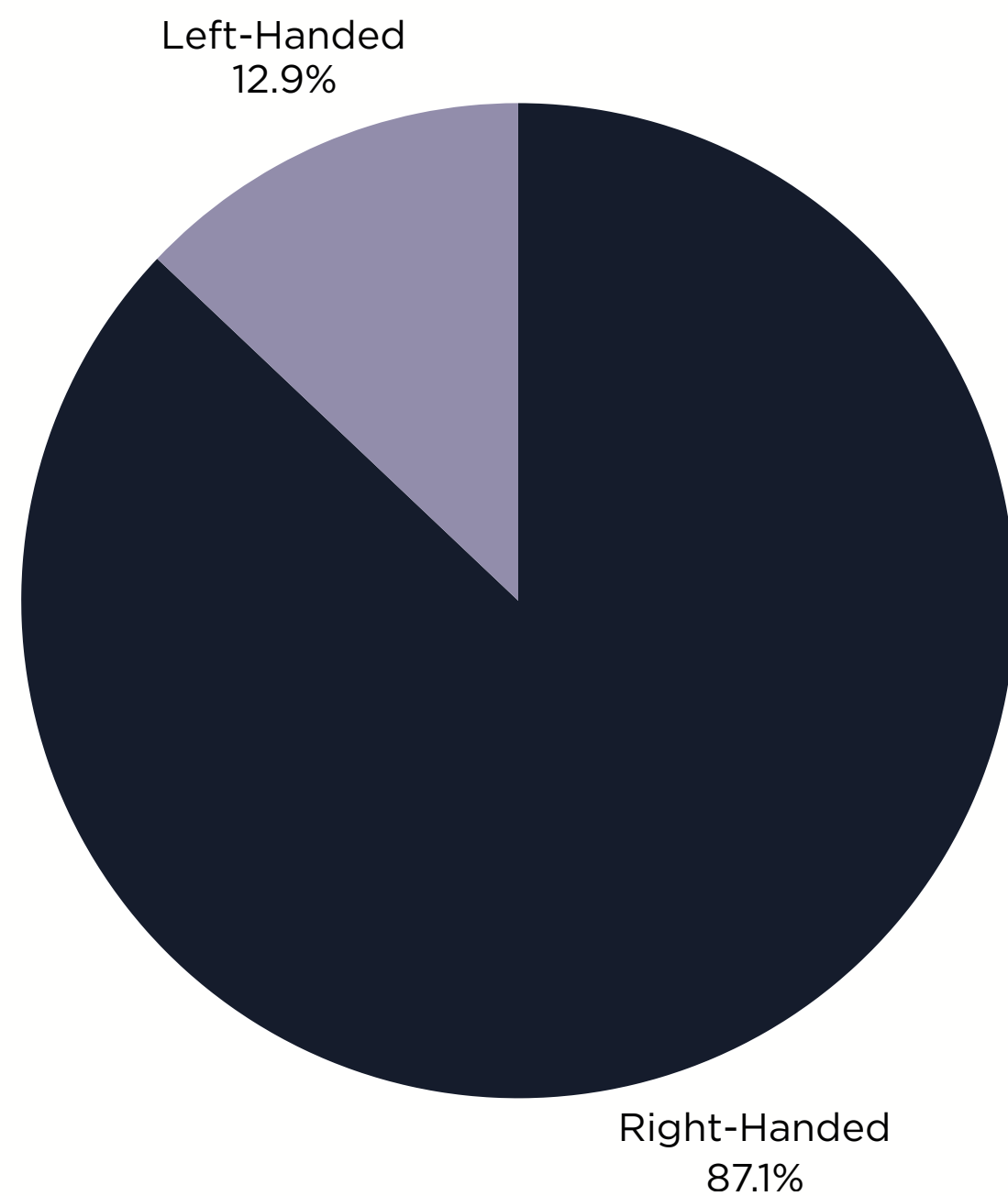
Left-Handed Faculty  
8.3%



Right-Handed Faculty  
91.7%

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# Student and Faculty Combined Results



# Calculated Values

$H_0$ : Proportion of left-handed students  $\leq$  the general population

$H_1$ : Proportion of left-handed students  $>$  the general population

- P-Values:
  - **Students:** 0.0588
  - **Faculty:** 0.7159
  - **Combined:** 0.273
- 95% Confidence Intervals:
  - **Student:** (0.0630, 0.3154)
  - **Faculty:** (0.0051, 0.1615)
  - **Combined:** (0.0581, 0.2008)

# Interpreting Results

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- Fail to reject  $H_0$ 
  - Lacking evidence to support alternative hypothesis
  - Still contains very positive results for future study
- Broad confidence interval caused by small sample size
- Very high potential for statistical significance with an increased sample size

# Limitations

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- Lack of participation in study
  - Increase in phishing security
  - No incentives provided
- Restrictions on studying human subjects
- Restricted to math majors enrolled in Junior/Senior level courses

# Conclusion

There is limited evidence to support the hypothesis that left-handed individuals are more prevalent in mathematics departments than the general population. However, the slightly elevated proportion among students may warrant further exploration with a larger or incentivized study.

# Contact Info

- Bryce Koch (Brycekoch74@outlook.com)
- Samuel Olatunde (psalmyz735@gmail.com)
- Dr. Joel Schmitter ( joel.schmitter@msutexas.edu )



# References

[1]

"Which Country Has the Lowest Percentage of Left-Handers?" Psychology Today, Oct. 2023. [Online]. Available: <https://www.psychologytoday.com/us/blog/the-asymmetric-brain/202310/which-country-has-the-lowest-percentage-of-left-handers>. [Accessed: Mar. 28, 2025].

# Supplementary Facts

## COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

### REQUIRED AND ELECTIVE MODULES ONLY

Introduction to RCR (RCR-Basic) (ID: 17009)

Authorship (RCR-Basic) (ID: 16597)

Collaborative Research (RCR-Basic) (ID: 16598)

Conflicts of Interest and Commitment (RCR-Basic) (ID: 16599)

Data Management (RCR-Basic) (ID: 20896)

Mentoring and Healthy Research Environments (RCR-Basic) (ID: 20983)

Peer Review (RCR-Basic) (ID: 16603)

Plagiarism (RCR-Basic) (ID: 15156)

Research Misconduct (RCR-Basic) (ID: 16604)

# Supplementary Facts

## Probability Computation

- Used binomial distribution

$$P(4) = 0.168\%$$

$$P(5) = 0.00823\%$$

$$P(6) = 0.000168\%$$

