

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

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

- Sparked Curiosity: Is this a trend in mathematics?

Let's put this to the test!



Show of Hands E

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▶ Preview

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

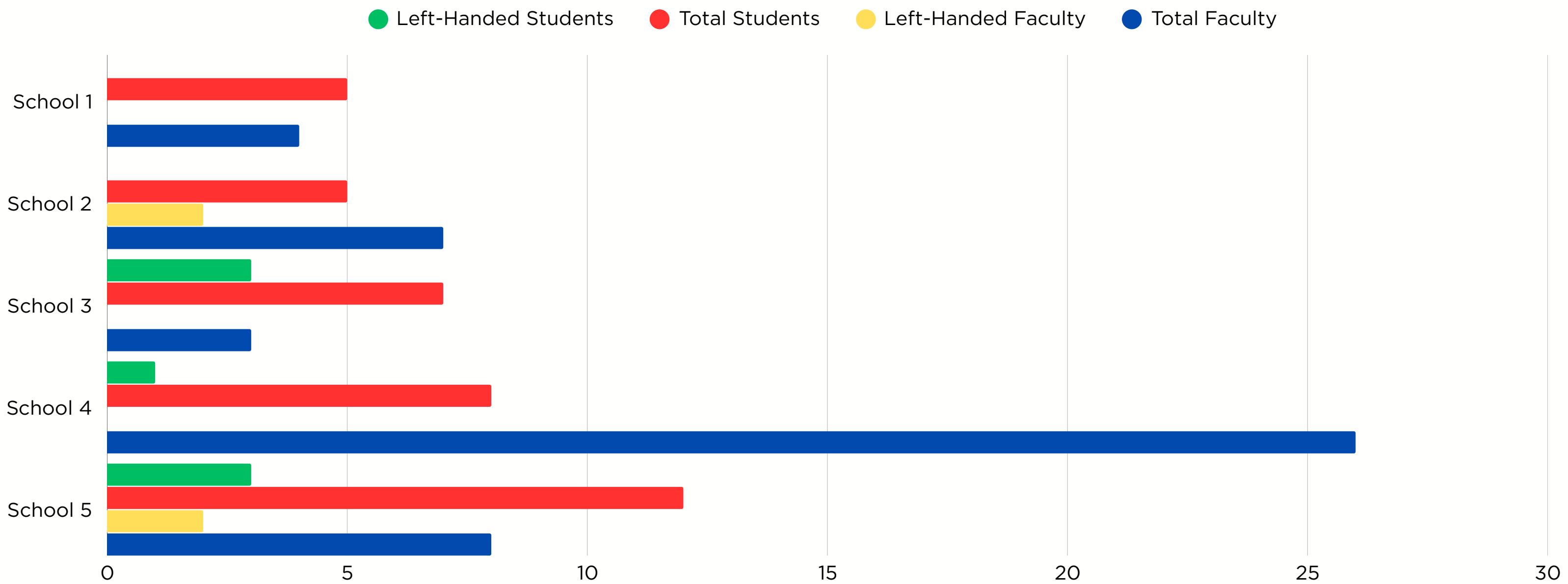
Hypothesis

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

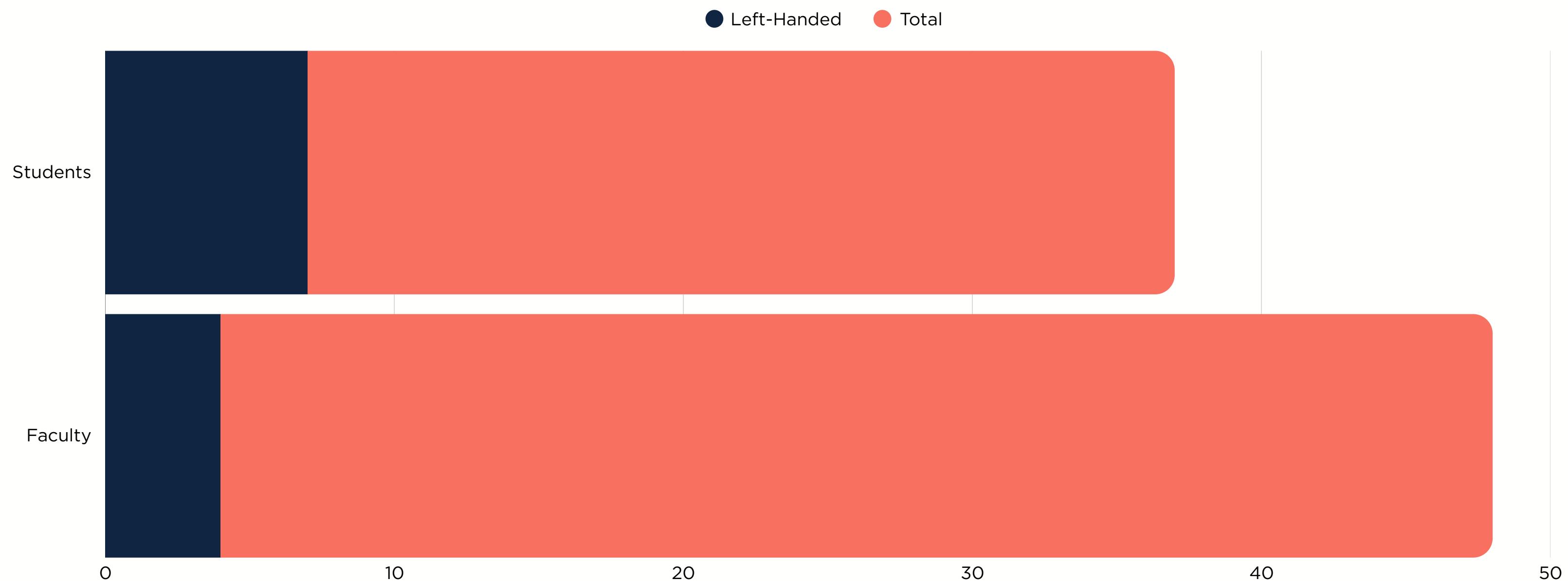
H_1 : Proportion of left-handed mathematicians $>$ the general population

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

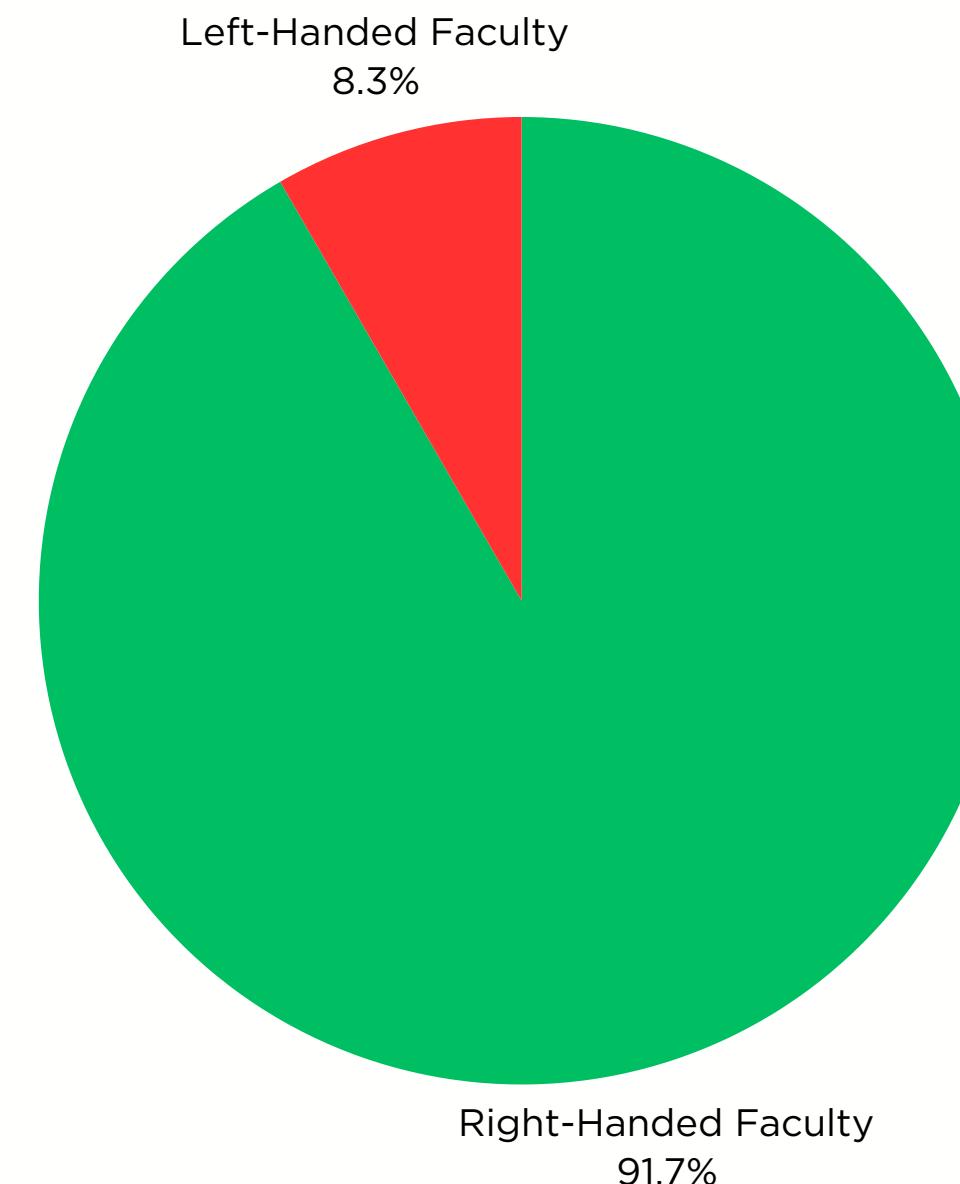
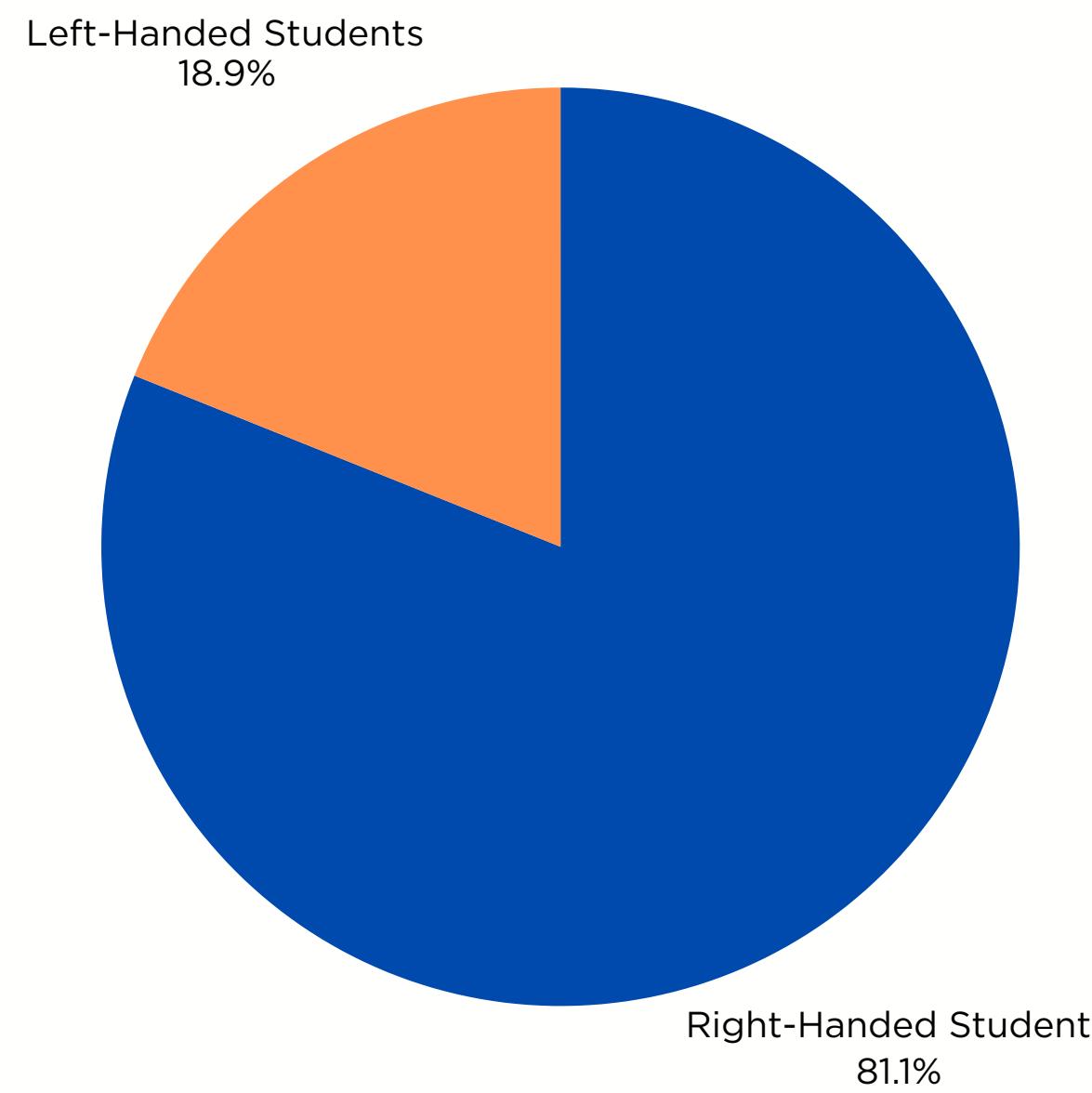
Data Collected



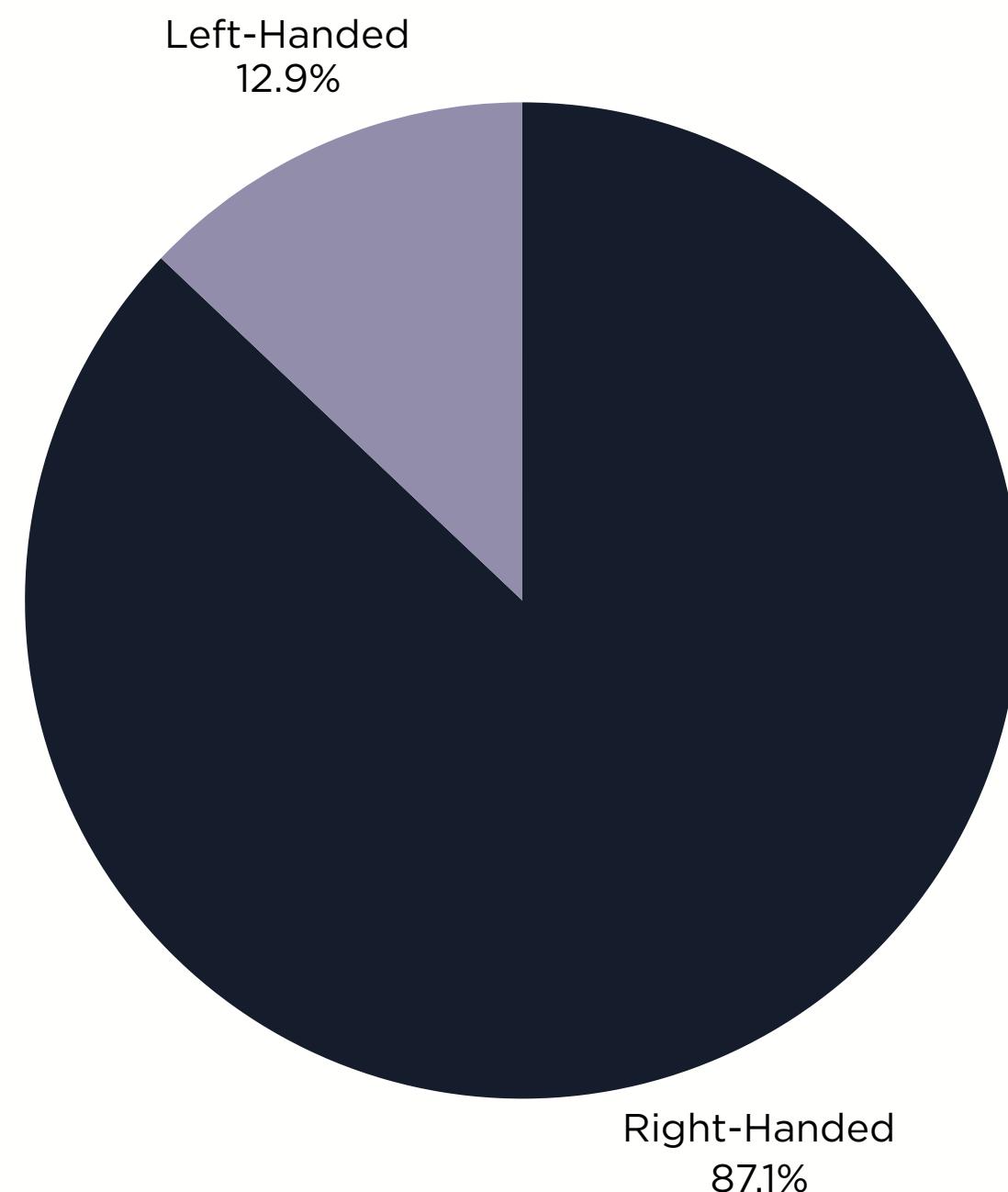
Data Collected



Results



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

- 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

- 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.

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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].

Suplementary Facts

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

REQUIRED AND ELECTIVE MODULES ONLY

[Introduction to RCR \(RCR-Basic\) \(ID: 17009\)](#)

[Authorship \(RCR-Basic\) \(ID: 16597\)](#)

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Supplementary Facts

Probability Computation

- Used binomial distribution

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

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

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

