

# STATISTICAL INFERENCE & LINEAR REGRESSION

BY: PIA AVENDANO & KHANH LUONG



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2. Use the random number generated on the calculator to assign the 16 students to participate in the study.

3. Participants are timed on:

- how fast they read the words on the list
- how fast they say the color in which each of the words is printed

4. Times are rounded to the nearest second.

Stroop Effect



The table

Student	Word	Color	Reading Time (s)	Color Naming Time (s)
1	red	red	12	10
1	yellow	yellow	15	12
1	blue	blue	18	15
1	green	green	14	11
2	red	yellow	25	15
2	yellow	red	20	12
2	blue	blue	16	14
2	green	green	13	10
3	red	red	11	9
3	yellow	yellow	14	11
3	blue	blue	17	13
3	green	green	12	10
4	red	yellow	22	14
4	yellow	red	19	11
4	blue	blue	15	12
4	green	green	13	10
5	red	red	10	8
5	yellow	yellow	13	9
5	blue	blue	16	11
5	green	green	11	9
6	red	yellow	24	13
6	yellow	red	21	12
6	blue	blue	17	13
6	green	green	14	11

**RESEARCH QUESTION**

RQ: "Can we use a student's word task time to predict his or her color task time?"

- Does the color in which words are printed affect your ability to read them?
- Do the words themselves affect your ability to name the color in which they are printed?

Study Design:  
1. Obtain a list of students from METS  
- total population of 25

Conditions to construct linear regression inference

- Randomly selected
- Independence
- Normality
- Quantitative

Normality: Shapiro-Wilk test results are not significant. The linear regression T-test is also not significant.

Quantitative: The response variable is quantitative.

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- Does the color in which words are printed affect your ability to read them?
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However, assume all conditions for the linear regression t-test to answer the research question.

RQ: "Can we use a student's word task time to predict his or her color task time?"

LSRL:  $y = 4.393 + 1.53x$

Hypotheses:

$H_0: \beta = 0$  Where  $\beta$  is the true slope of the LSRL of time for word

$H_a: \beta \neq 0$

Test

$t = \frac{b - \beta}{SE_b} = \frac{1.536 - 0}{0.5728} = 2.6799$  p-value = .0179 df = 19

Conclusion

Since p value, .0179, is smaller than the significant level  $\alpha = 0.05$ ,