

1. What is our independent variable? What is our dependent variable?

Independent variable is the congruent word condition

Dependent variable is the time

2. What is an appropriate set of hypotheses for this task? What kind of statistical test do you expect to perform? Justify your choices.

Null hypothesis ->  $H_0$  : mean of incongruent - mean of congruent = 0

Alt hypothesis ->  $H_A$ : mean of incongruent - mean of congruent > 0

1 tailed T-test will be used

Now it's your chance to try out the Stroop task for yourself. Go to [this link](#), which has a Java-based applet for performing the Stroop task. Record the times that you received on the task (you do not need to submit your times to the site.) Now, download [this dataset](#) which contains results from a number of participants in the task. Each row of the dataset contains the performance for one participant, with the first number their results on the congruent task and the second number their performance on the incongruent task.

3. Report some descriptive statistics regarding this dataset. Include at least one measure of central tendency and at least one measure of variability.

Congruent:

High: 22.328

Low: 8.63

Range: 13.698

mean: 14.051

Standard Deviation: 2.775

Incongruent:

Hight: 35.255

Low: 15.687

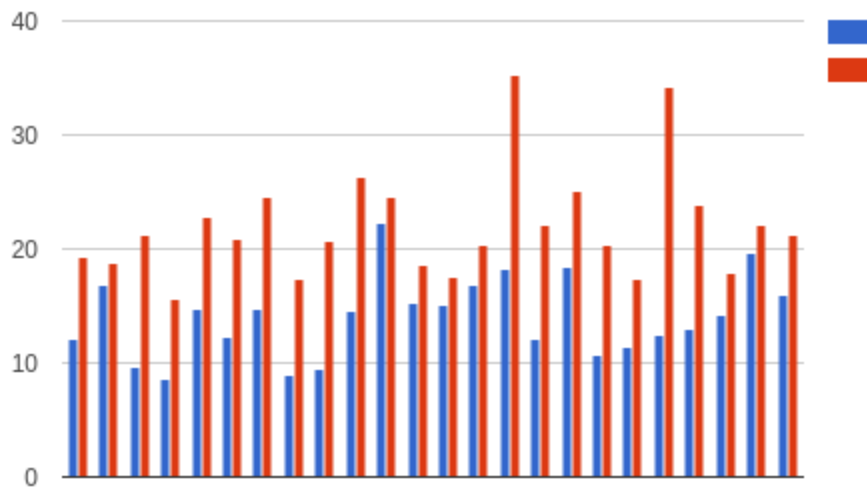
Range: 19.568

mean: 22.135

Standard Deviation: 1.329

4. Provide one or two visualizations that show the distribution of the sample data. Write one or two sentences noting what you observe about the plot or plots.

Red color presents incongruent data, and blue color presents congruent data for each person. Everyone spent more time in the incongruent test. The mean difference is 8.084.



5. Now, perform the statistical test and report your results. What is your confidence level and your critical statistic value? Do you reject the null hypothesis or fail to reject it? Come to a conclusion in terms of the experiment task. Did the results match up with your expectations?

M-diff = 7.965

Alpha = .05

t -critical = 2.807

T-stat = (mean of Incongruent - mean of congruent)/(S/sqrt(n)) = 7.965/(4.865/4.899)=8.02

CI = M-diff +/- t-critical \* (S/sqrt(24)) = 7.965 +/- 2.807 \* (4.865/4.899) = 10.75, 4.9

t-stat (8.02) > t-critical (2.807) which is outside of 95 % confidence level; therefore, we reject the null hypothesis.

We concluded that people spend more time to read incongruent words than congruent words as expected.

6. Optional: What do you think is responsible for the effects observed? Can you think of an alternative or similar task that would result in a similar effect? Some research about the problem will be helpful for thinking about these two questions!