Stroop task

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

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

Now it’s your chance to try out the Stroop task for yourself. Go to [this link](https://www.google.com/url?q=https://faculty.washington.edu/chudler/java/ready.html&sa=D&ust=1508492076259000&usg=AFQjCNHAdksE_uYASLKPwe6x8QfUn8gfoA), 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](https://www.google.com/url?q=https://drive.google.com/file/d/0B9Yf01UaIbUgQXpYb2NhZ29yX1U/view?usp%3Dsharing&sa=D&ust=1508492076259000&usg=AFQjCNEvJst-S3ob2SzOKH96alaYFDnOSw) 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.

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.

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?

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!

1 Variable:

The independent variable in the experiment in the variable is the conditions of words, which has two levels: a congruent words condition, and an incongruent words condition. The dependent variable in the experiment is the time it takes to name the ink colors in equally-sized lists.

2.1 Hypotheses for this task:

The null hypothesis is that there is no significant difference in the population average amount of time to name the colors of words in congruent and incongruent conditions.

H0: u1=u2

The alternative hypothesis is that there is significant difference in the population average of the amount of time to name the colors of words in congruent and incongruent conditions.

Ha: u1 ≠u2

u1 is the population mean of the time it takes in congruent words condition, u2 is the population mean the time it takes in congruent words condition.

The alternative hypothesis is that the conditions of words influences the time it takes to name the ink colors in equally-sized lists, and the time it takes to name the ink colors in equally-sized lists in two conditions should be different.

2.2 Statistical test:

Test z and test t are applicable to comparing means. For this test, we have less than 30 samples and we don’t know the population’s standard deviation. We assume the population is normally distributed. The two samples are dependent since they are performed by the same people. Based on these assumptions, I choose to perform dependent T-test for paired two-samples. The alternative hypothesis is two sided so I choose a two-tailed test.

Since we don’t know the standard deviation of the population, we can’t use z test.

T-test can be used to test whether the means of two populations are equal.

Descriptive statistics:

The measure of central tendency is mean and the measure of variability is standard deviation.