

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

The independent variable is the colored word.

The dependent variable is the time record to name the ink colors

**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 when difference between two means (time to name congruent words and time to name incongruent words) are equals or insignificant different. Alternative hypothesis if the difference between two means are significant different.

I will dependent t-test for a paired samples. Because I have just samples, with the same subject, and I don't have the parameters for population.

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

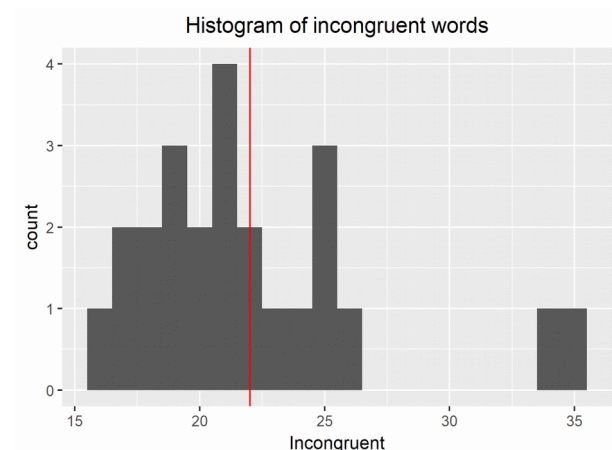
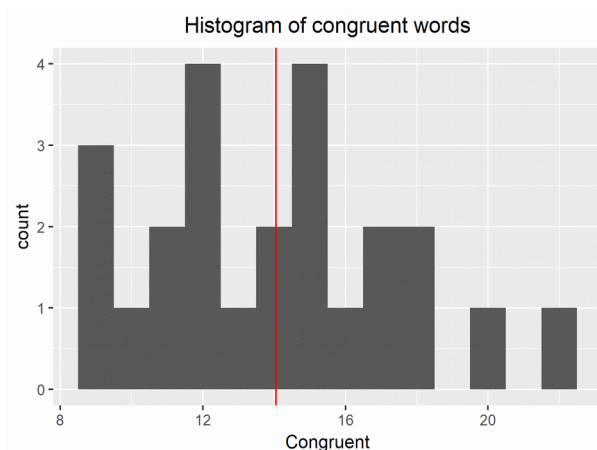
Congruent mean = 14.051

Incongruent mean = 22.016

Point estimate = -7.965

Standard deviation from difference = 4865

**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.**



There are histogram of two groups of data. In the second plot we can see something close to a normal distribution with a peak and a outlier on the left. Otherwise, in the first plot we cannot see a normal distribution.

The red lines are the means

**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?**

n = 24  
df = 23  
Confidence level = 99%  
t-critical value =  $\pm 2.807$   
Congruent Mean = 14.051  
Incongruent Mean = 22.016  
Point estimate = -7.965 (Difference of means)  
S (SD of the difference) = 4.865  
t-Statistic =  $-7.965 / (S / \sqrt{n}) = -8.021$   
P value is less than 0.0001

Since t-statistic is -8.021 and far from t-critical value (-2.807) I reject the null hypothesis. The results match with my expectation because when I did the stroop effect test my times to name colors were very different.

**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!**

In my opinion our brain try to read the word automatically, then we get confused to name the incongruent color.

I find the numerical stroop effect. The experiment shows 2 digits are shown with different values or different physical sizes. In the numerical task the participants have to say which digit is numerical higher. In the physical test, they have to say which is physically higher.