

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

Independent variable is words conditions of the stroop test carrying the values congruent words and incongruent words

Dependent variable is the time in sec it takes to complete the tasks

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

Hypothesis:

Null Hypothesis :

There is no significant difference in time when people read congruent and incongruent words .

$$H_0 = \mu_{\text{congruent}} - \mu_{\text{incongruent}} = 0$$

Alternative hypothesis :

There is a significant difference in time when people read congruent and incongruent words .

$$H_A = \mu_{\text{congruent}} - \mu_{\text{incongruent}} \neq 0$$

Statistical test:

Paired t tests are appropriate for this dataset. A paired t-test is used when you have two related observations (i.e. two observations per subject) and you want to see if the means on these two normally distributed interval variables differ from one another

We will determine the t value and check the correspondingly p value with the critical value to test our hypothesis.

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

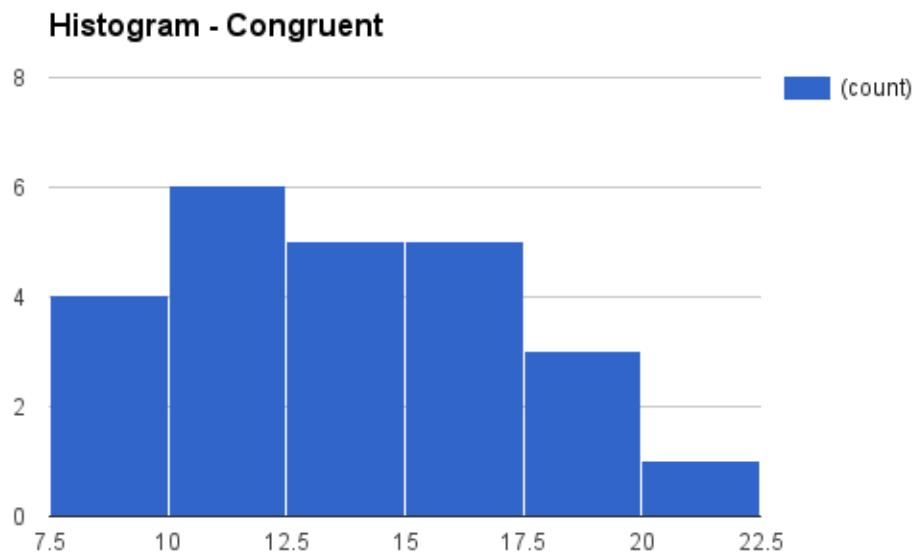
Central Tendency

	Congruent	InCongruent
Median:	14.357	21.018
Mean:	14.051	22.016

Variability

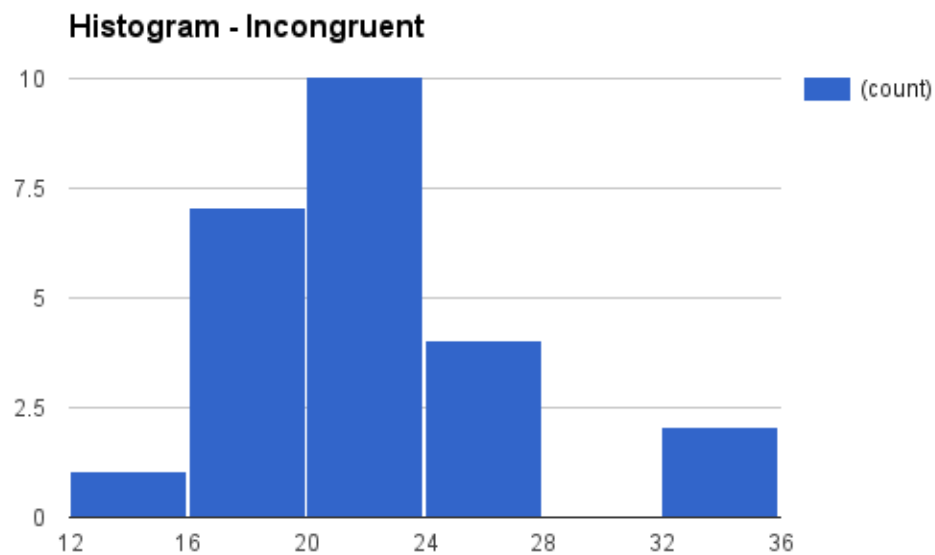
Variance:	12.669	23.012
Std deviation:	3.559	4.797

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.



Positively skewed distribution

The distribution shows that maximum number of people took about 10-17.5 seconds to read congruent words.



Normally distributed.

The distribution says that maximum number of people took about 16-24 seconds to reach incongruent words and more than 60% of that group took about 20-24 seconds.

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?

95% confidence interval of this difference: From -10.01903 to -5.91056

$\alpha = 0.05$

$df = 23$

$SED = 0.993$

Calculated t value is $t = 8.0207$

From t table, t critical value for $\alpha = 0.05$ for a one tailed test with $df = 23$ is -1.714

Based on the following results, since t calculated falls well outside the t critical range, the result is statistically significant.
Hence we reject the null hypothesis.